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Southern Medical Journal

Journal of The Southern Medical Association

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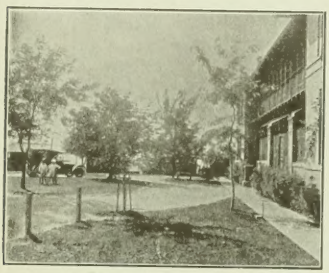

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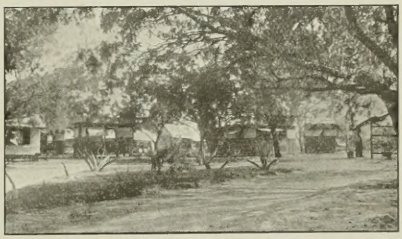

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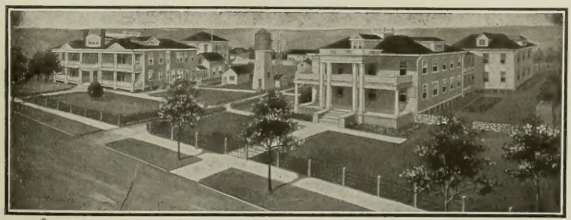

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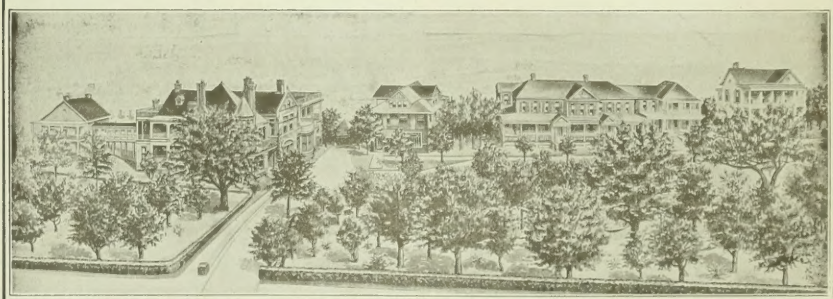

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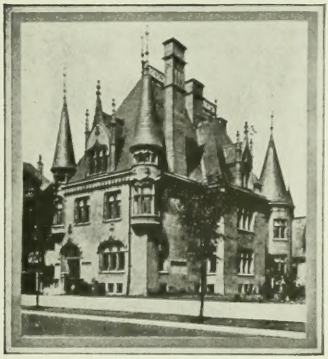

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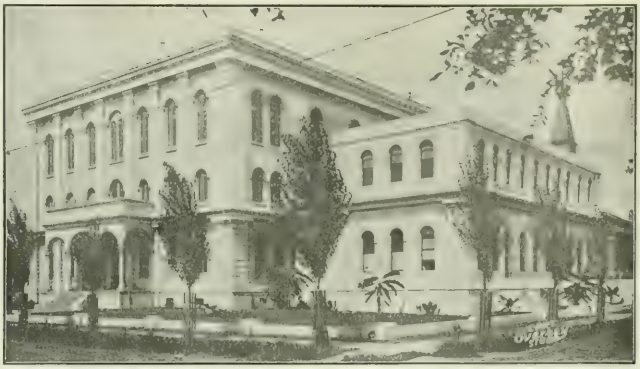

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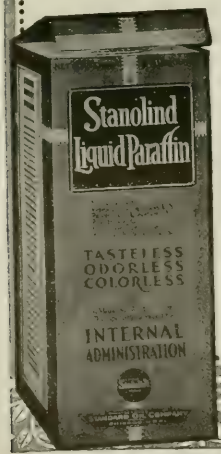

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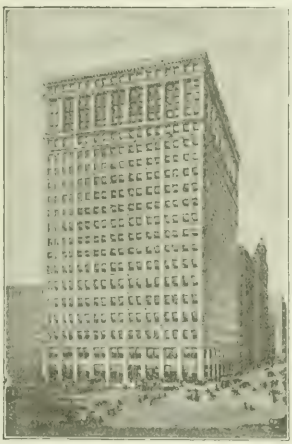

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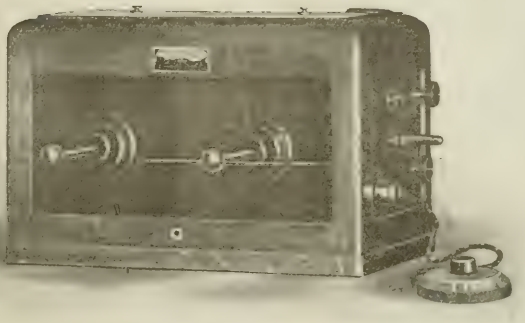

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Volume X FEBRUARY 1, 1917 Number 2

SPECIAL ARTICLE

THE RELATION OF THE MEDICAL PROFESSION TO MEDICAL PREPAREDNESS*

By Robert E. Noble, M.D.,
Major, Medical Corps, U. S. A.,
Washington, D. C.

The war in Europe has caused us as a nation to think of our future, and to consider the question of preparedness against war as of paramount national importance. This is a question that has awakened more interest in the United States than any other one before the people; for on ultimate analysis preparedness is but the premium on the life policy of the nation, and medical preparedness is the premium on the health of the Army. In all the discussions upon this subject but few voices outside the medical profession have been raised demanding medical preparedness. This phase of the question is one that in time of peace creates but little interest, yet when war comes it immediately presents itself; and then and only then is it considered a matter of the most vital importance, since the lack of medical preparedness causes armies to melt away from disease more rapidly than from battle casualties.

In the past, deaths from disease have caused a drain upon the human resources of a country at war four times greater than the total number killed and mortally wounded. In our own country the lack of medical preparedness has caused more to be paid in pensions than the entire cost of our last great war; it has returned to civil life men broken in health and in body who should have been saved to the country as useful citizens, whose labors should have contributed to its development and riches. Yet the medical service is the one service in all armies that receives the least consideration in time of peace in so far as preparing against the strain of war is concerned. I may best illustrate this by saying that in our own service, after the Spanish-American War and the reorganization of the Army in 1901, it required seven years of constant effort on the part of the Medical Department to obtain recognition of its just claims; three years of this seven were to obtain proper indorsements, and four years in trying to persuade Congress to pass the necessary laws.

Until such time as the profession takes a firm stand in regard to the Reserve there will be no true preparedness in so far as the Army is concerned. You may ask why? Because the War Department will never ask for a medical service in time of peace of such number as to permit the entire officering of the Army at war strength; Congress would not grant such a demand, nor is a medical service of such magnitude necessary.

The medical service of the Army is, and is only intended to be, the nucleus around which in war an efficient sanitary service can be built. This is all we can ask for and all we can expect.

Congress has within the last eight years passed two acts that pave the way for medical preparedness. The first was the Act of April 23, 1908,—an Act reorganizing the Medical Corps of the Army and creating the Medical Reserve Corps. This last is the most far-reaching and important single piece of legislation affecting the medical service of the Army ever passed by Congress. And this, due to lack of interest, required a continuous struggle of four years, from 1904 to 1908,

*Read before the Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

to have it placed upon the statutes, despite the fact that this legislation was recommended by two presidents and three secretaries of war.

The wisdom of this act, in so far as the Army is concerned, has been amply demonstrated. The calling of the National Guard into the Federal service by the President required a large increase in the number of medical officers. Over 500 officers of the Reserve responded to the request of the Surgeon General for assistance. Today there are 369 Reserve officers on duty with troops in the field and on other assignments out of a total of 2,026 officers in the Medical Reserve Corps. This speaks well for the patriotism of the profession, as a great majority of those who accepted service did so at a sacrifice.

What is the Medical Reserve Corps, and what is the future? The Medical Reserve Corps, or as it is to be, the Medical Section of the Officers' Reserve Corps, is a body of medical men who have accepted commissions from the President in order that in time of peace they may, in so far as is possible, prepare themselves for service in war.

The Act of June 3, 1916, was the second great step toward medical preparedness. This act placed the Medical Corps of the Army on a definite percentage basis (this is seven medical officers per thousand enlisted strength of the Army); and created the Officers' Reserve Corps of the Army, which in due course will supersede the Medical Reserve Corps.

Although the Medical Reserve Corps is not to be abolished by law prior to June 3, 1917, there is authority to transfer at any time the Medical Reserve Corps to the Medical Section of the Officers' Reserve Corps. With this idea in view the Surgeon General recently sent a circular letter to all Reserve officers, quoting in full the law and mentioning several essential points of difference. These differences are as follows:

1. Change in name without change in relation to the Surgeon General's Office.

2. Commissions are issued for a period of five years and in the grades of first lieutenant, captain, and major.

3. Up to the limit of appropriations, officers of the Reserve may be ordered to attend camps of instructions for fifteen days each calendar year. This may be interpreted as follows: The Medical Department will follow the same plan as was followed in the case of the Medical Reserve Corps, that is, circularize the Corps and send to camps of instruction only those who express the desire to go. The circular will give the location of the camps and the training periods. Officers will be requested to select such training period as they may desire. Orders will then be issued for the period selected.

4. Officers of the Medical Section of the Officers' Reserve Corps are expected to take the Correspondence Course. This is desirable, as the course covers in its four years the subjects of administration, camp hygiene, the duties of a medical officer, the customs of the service, and other requirements with which a medical officer should be familiar. But for those officers who are prominent in the profession, who are specialists, as surgeons, internists, pathologists, etc., who would in time of war be assigned to duty as specialists or for duty at base hospitals, the course is not essential. But for any officer who is to perform field duty it is essential that he should complete the four courses provided.

The same applies to field training and attendance at the camps of instruction. Both the correspondence course and the work in camps of instruction are considered highly desirable, but are not compulsory.

5. In time of peace no officer above the grade of first lieutenant can be ordered into active duty, and no first lieutenant can be ordered to active duty *without* his consent. The provision limiting active duty to first lieutenants does not apply to camps of instruction. In other words, officers of any grade may be ordered to these camps.

6. In time of war, or when war is imminent, that is, when conditions are such that it is believed that war can not possibly be avoided, all officers of the Officers' Reserve Corps are of course subject to the call for duty. This is to be expected, as each owes his duty and intends to fulfill his obligations to the country.

When called and assignments are made, it is the desire of the office to assign officers to duty according to their specialty.

It can be readily understood that this plan can not in *all* cases be followed, as conditions will arise that necessitate the assignment to a duty other than the specialty in civil life, but we desire to avoid as far as possible placing square pegs in round holes.

The Department is desirous that all officers of the Medical Reserve Corps transfer to the Officers' Reserve Corps, and we expect to maintain with the Reserve the same cordial relations as have existed in the past between the Surgeon General's Office and the officers of the Medical Reserve Corps. The Surgeon General wishes me to say that in accepting a commission in the Medical Section of the Officers' Reserve Corps you are a medical officer of the Army—that you are not only in the Medical Department, but that you are of it.

The strength of the Corps is distributed as follows:

On active duty	369
Inactive	1657
	2026

In addition, 657 applicants have been examined and recommended for commission, making a total of 2683.

This is a pitiably small number for the 100,000 physicians in the United States. What number is required? Twenty-five thousand. Why such a large number? Because in past wars armies have been recruited by the hundred thousands, whereas in wars of today armies are recruited by the millions of men. Statistics apparently reliable state that the casualties in the present European War have been above 23,000,000 of men, and this for only two years of war. One country alone maintains hospitals with more than 600,000 beds for its sick and wounded.

In the field, according to tables of organization, five medical officers are required for each 1,000 of troops. This does not take into consideration the medical officers necessary for the lines of communication, the base, and the service in home territory.

For example, what is the number of medical officers required for an army of 200,000 men in the field, with but one base and one line of communication? Allowing but 10 % for sick and wounded—and one battle may bring under the care of the medical service a greater number of wounded alone—you will no doubt be surprised to know that 2,035 medical officers are required, 482 more than is authorized for the entire Army under the provisions of the Act of June 3, 1916, and this Act gave to the Medical Department all that it asked for.

It is the Medical Reserve that in time of war will contribute the great bulk of medical officers, and it is only by a trained Reserve that we can escape a national humiliation, and especially the humiliation of the medical profession. Unless we have an adequate and trained Reserve the experiences of past wars will be repeated. Indifference now in time of peace will cause history to repeat itself, and again in time of war will we have protests by the people because of the lack of preparedness. Then will we again hear indignation and sorrow expressed because of the useless waste of life and the unnecessary suffering. But this indignation will be only after a war has actually begun. These protests will be all the more vehement because of the guilty knowledge that they alone are responsible for the lack of preparation for the proper care of the sick and wounded. Inefficiency will be charged, a scapegoat found, and for the time the public conscience will be quieted and the people satisfied. Proper preparedness will then be provided; but it will be an emergency preparedness, expensive in money and more expensive in the lives that have been uselessly sacrificed.

Our past history is full of such examples. The report of the Sanitary Commission of the Civil War and the report of the Dodge Commission on the Spanish-American War are public documents well worth study.

Lack of a trained sanitary service is one of the greatest of handicaps; for an army with an untrained sanitary personnel must guard and care for its sick and wounded at the front instead of being relieved of this impedimenta by prompt evacuation to the base. This failure means interference with that rapidity of movement of an army so essential to success; and, in addition, there is the loss of lives that should have been saved and the suffering that should have been pre-

vented. Lack of medical preparedness means military absenteeism. This form of absenteeism in the Federal Army during the Civil War amounted to over 600,000 men—men who were maintained at a heavy cost to the Government, from whom the Government received no return, and the survivors of whom are today pensioners on the Government. It means criticism at home, discontent of the soldiers, and as a consequence a loss of morale, a burden under which no army can hope to succeed in war.

The war in Europe teaches us many lessons. One of the most important is that although emergency preparedness may be an efficient preparedness, it is the most expensive preparedness in money, in time, and in lives. It teaches us that training is the great essential for success in military life, and that success is measured by the prompt and efficient preformance of duty.

Some of you were in the Spanish-American War and remember the concentration camps. I wish to bring to your attention but one example of the lack of preparedness in that war and to contrast it with one example of preparedness.

For four months in 1898 a volunteer division was camped at Jacksonville, Fla. This division with a mean strength of 10,759 men had 1,729 cases of positive typhoid fever and 964 cases of fever, probably typhoid, with 248 deaths from this one disease and 281 deaths from all other illness, a total of 529 deaths from disease in four months in a division of less than 11,000 men; an annual death rate of 147.5 per 1,000, and for diseases other than typhoid the death rate was 78.3 per 1,000 per annum. Contrast this with the division of the regular Army encamped in 1911 for the same length of time at San Antonio, Tex. This division with a mean strength of 12,801 men had one mild case of typhoid fever and but eleven deaths from all other illness; a death rate of 2.58 per 1,000 per annum; a rate one-thirtieth of the death rate at the Jacksonville camp for diseases other than typhoid. These camps were in the same latitude for the same length of time, and each was supplied with artesian water. I wish by this comparison to illustrate one point, and that is that in Texas the medical officers were trained officers.

That the Medical Department may properly and successfully perform its duties in war, it desires to create a Reserve of medical officers ten times the strength of the present Reserve Corps. And in order that these officers may efficiently perform their duties they must be trained in time of peace for their duties in war.

You who are teachers can interest the student in the medical service of the Army as a career,—for it offers much to the ambitious man, or interest him in the Reserve in order that he may fulfill his duty to his profession and to his country.

I wish to ask you as medical men to do your part by teaching the fact that medical preparedness is just as essential as armed preparedness, and without it, armed preparedness will fail, or purchase success at a cost of human life out of all proportion to that necessary. Let each do his full duty by interesting the medical student in the Army as a career; and you who are in the active practice of your profession by joining the Reserve and studying now, in time of peace, how we may play successfully our part in the tragedy of war; avoid the mistakes of the past; create a medical preparedness that means the application of efficiency to the conservation of health and life; and coordinate the life-saving with the life-destroying branches of the service. By so doing we can avoid the humiliating condition of the past; avoid failure; avoid a forced abandonment of a campaign, as was the case in the present war where from one small area, from April 25 to October 20, 1915, only 175 days, one country removed more than 78,000 sick, and in the succeeding twenty days removed 18,000 additional sick from that one area, and later withdrew entirely from the field of operation.

Medical preparedness means a co-operation between the medical department of the Army and the medical profession, the union of the two.

This end can be attained only by building up professional and public sentiment, by a campaign of education, forcing the realization of the very patent fact that an efficient medical service is an asset of in-

calculable value, not only to the Army, but to the country as a whole.

It has been well said that "Success in war is the result of adequate military preparation followed by effective military operation." This axiom can not be followed if there is a lack of a competent medical service.

As a nation we have never learned a lesson from the bitter school of war. But in the light of the present war in Europe and of our own past experiences, shall we be guilty again of entering upon a war unprepared to meet the emergencies that must necessarily arise? Shall we waste lives in war in order that we may save in times of peace a few tens of thousands of dollars each year? This can be prevented only by education, by building up a sentiment among the people that an efficient medical corps is just as necessary as an efficient combatant force, and that an army without an adequate medical corps is not an efficient army; that medical preparedness means efficiency and that efficiency must be learned in times of peace; that the sanitary personnel must be of both the regular service and of the Reserve, and in numbers sufficient to perform their duties in war. This education can be made fruitful only by the teachings of the medical profession, a profession whose devotion to humanity is recognized, a profession that is unselfish in its service. Mr. Breckenridge, late Assistant Secretary of War, in speaking of the Army, said: "The Medical Corps of an army is the great conserving agency of a destructive organization. To wage war successfully, the greatest amount of destruction must be visited upon the armed forces of the enemy. For this end is required the utmost conservation of health, energies and life of the army, and to this end the highly trained and specialized medical corps is absolutely essential." An army's duty is to destroy the armed force of the enemy. The extent and thoroughness of this destruction in the European War was illustrated by Herr Bernstein, of the German Reichstag, who recently stated in a speech before that body that "The number of killed in this war is estimated at 4,500,000. The number of permanently crippled is estimated at 8,300,000. The number of wounded is estimated at 11,000,000," a total of 23,800,000. The accuracy of these figures is not vouched for. Personally I believe these estimates are high; but we do know that the losses are beyond the grasp of the human mind, and the end is not in sight. We know that the medical profession of Europe is taxed beyond its utmost limit; that there are not enough medical men for both the civil population and the armies in the countries now at war; and that the services of volunteers from the United States have been eagerly accepted.

Of all the countries of the world, the United States is the only one that has a medical profession sufficient in number to serve in time of war both the civil population and the army. But the profession is unorganized and a war in the near future with a first class power would result in a waste of life that organization now would prevent. Had the ratio of the profession to the population of the countries now at war equaled that of the United States, many of the estimated 4,500,000 dead would have been saved; many of the 8,300,000 cripples would have been made whole.

In a country such as ours, a country governed by public opinion, useless waste of life in war means failure in a campaign. On the medical profession rests a heavy responsibility, for with the profession rests the subject of medical preparedness.

MEDICINE

(INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.)

THE ROLE OF FOOD IN THE ETIOLOGY OF CARDIO-VASCULAR-RENAL DISEASE*

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In presenting this paper I wish to have it clearly understood that I do so, not with the idea of claiming that all nephritis is due to faulty metabolism, or even that the majority of cases have their inception in such, but rather, that faulty metabolism *may* produce cardio-vascular-renal disease, and to urge a consideration of this factor in our therapeutics of this condition. The average practitioner is well acquainted with the role of lues, the infectious diseases, and metallic poisons in producing the condition, but is prone to neglect dietetic errors as a causative factor. That the influence of diet is beginning, however, to be more appreciated by the clinician is evidenced by recent publications, most conspicuously one by Bishop[1]. He writes from the experience of a clinician, and while I cannot agree with him that the amino acids have any etiological influence (I have never found any of them toxic in experimental animals except in large doses), his book is welcomed by me on account of its consideration of the intermediate metabolism of proteins in relation to the therapeutics of arteriosclerosis. Bishop's clinical experiences coincide with my views of the dietetic treatment of these cases presented in a paper before this society in 1911[2].

In considering the role of food in the etiology of cardio-vascular-renal disease one is limited to a consideration of the role of proteins, as no evidence has ever been presented showing that the carbohydrates or fats have any influence, and one would scarcely expect them to, as their final products of oxidation are carbon dioxid and water. This holds true also for water and salts. In rare instances of acidosis, however, the products of incomplete oxidation of fats may have an irritating effect upon the renal epithelium, but in even these few instances, I believe they are secondary to the effects of the incomplete oxidation of the protein molecule. The problem, then, resolves itself into a consideration of the role of proteins in the eiology of cardio-vascular-renal disease, and is a question of the quality of the food rather than the quantity.

It must be borne in mind that after cleavage of the protein molecule in the gastrointestinal tract through the stages of albumose, peptone and amino acids, the latter are absorbed and are used by the body to repair its tissue catabolism. Any protein above the needs of the body for repair, adds just so much more nitrogenous waste to the blood, which must be excreted by the kidneys. Any organ which is overworked will sooner or later become defective in function and the evil effects of an overindulgence in protein food is recognized universally in the therapeutics of purely renal conditions. This is often overlooked, however, in the dietetics of cases in which the cardiac or vascular symptoms predominate. To understand the possible evil effects of an excessive protein diet, one must understand also that undigested protein, subjected to the action of putrefactive bacteria in the large bowel, undergoes cleavage, and simpler products are formed, as by the digestive enzymes. These latter products are not innocent amino acids, but, are highly toxic amins, which are detoxicated by the normal liver. When they are absorbed in excessive amounts, or if the cells of the liver are unable properly to function they find their

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way into the general circulation and exert their toxic influence.

Several years ago Duval[3] called attention to the changes similar to beginning atheroma, induced in rabbits by the introduction of the toxin from glanders, while Thayer[4] called attention to the frequency with which changes in the heart and blood vessels followed typhoid fever. These are instances of the effects of proteolytic poisons and will be referred to later. Some writers, notably Bishop[1], in New York, have attempted to explain this toxic action of proteins by sensitization. Pearce[5], however, says, "The weak sensitizing power of washed kidney extract is taken as evidence that foreign proteins of the kind used are not held in the tissues of the kidney, and if these results may be applied to nephrotoxic proteins, it follows that nephritis is not due to selective and persisting fixation of a protein by the renal cells but is due to the action of such protein merely during the process of its elimination." I am accustomed, from my training, to view the whole question of protein sensitization from a chemical standpoint, while most observers view it solely from a biological one. I believe that it is universally agreed since the work of Vaughan[6] that the toxic effects of a foreign protein are due to the rapid breaking up of this substance and the liberation therefrom of some poisonous radicle or radicles. To me it is logical to presume that the poisonous radicles will exert their influence whether they are formed parentally or in the intestinal canal, provided they are absorbed unchanged.

Many attempts have been made to isolate and identify the poisonous group of atoms, but as yet no incontrovertible evidence has been offered to convict any one particular substance. It is more than likely that many such groups will in time be isolated and identified. That paraoxyphenlyethylamin and isoamylamin, derivatives of tyrosin and leucin respectively, are capable of markedly raising arterial blood pressure has been conclusively proven. These amins have never been isolated from the circulating blood in cases of arterial hypertension, and therefore our opinions must still be based upon empirical grounds. Croftan[7] experimenting on ten rabbits with daily injections of 1 c. c. of slightly alkaline solutions of xanthin and hypoxanthin was able to demonstrate changes in the arteries analogous to those seen in retention nephritis. All experimental work in this line on rabbits, however, has been questioned since Miles and Johnstone[8], as well as Pearce[9], called attention to the spontaneous arterial degeneration to be found in some rabbits at autopsy.

However, clinical experience often precedes laboratory findings in solving medical questions and is often the best guide to a rational therapy, but neither should be disregarded altogether. Bouchard[10], Metchnikoff[11], Combe[12], and others, including the writer[13], have for many years urged a consideration of the influence of intestinal putrefaction, but the clinicians have been slow to accept these views, and it is amazing to me how seldom a routine examination of the urine for indican is made in the management of most cases of cardio-vascular-renal disease. That the profession is at last beginning to realize that intestinal putrefaction may at times be a causative factor is evidenced by the replies obtained by Bishop[1] from some of our leading internists regarding the question of the probable etiology of arteriosclerosis. Dr. Robert H. Babcock[14], of Chicago, writes, "These changes, in my experience, are met with most frequently in persons of rather sedentary habits who suffer from intestinal intoxication, whether conscious thereof or not." Dr. S. Solis Cohen[15], of Philadelphia, states, "The marked pathological hardening I look upon as the result of infection or intoxication of one or another kind, *frequently intoxication with food poisons*, even in those who abstain from alcohol and nicotin, and who have not become infected with lues, etc." However, the majority in replying do not mention intestinal putrefaction as even a possible cause, and while the evidence to be submitted herewith is not absolute, it is so strongly presumptive that it cannot be disregarded, and will tend to stimulate further research along lines of metabolism.

Numerous attempts have been made to isolate and indentify the products of intestinal putrefaction in the blood without success. The differentiation of the volatile amins and ammonia is extremely difficult and they are present in such minute quantities in the blood, that as yet our technique

has not allowed us to identify them. The volatile amins, I have found, pass over quantitatively in a Folin apparatus, and ever since I determined this five years ago, I have felt that a large proportion of the nitrogen in the blood of the portal vein which has been estimated as ammonia, is in reality existant as putrefactive amins. In consequence, my experimental work on the influence of intestinal putrefaction has been limited to the injection of pure amins, and of extracts of human feces. Results of this work carried on in 1911 have appeared elsewhere[16], but the effects noted upon the kidneys may be of interest. Eight rabbits which had received non-lethal injections of sterile extracts of human feces over a period of two months developed albuminuria and typical diffuse nephritis. The protocols of these experiments were lost and have never been published, but during the past summer I have been able to repeat the experiments.

Two important facts had early been established: (a) That the human stool varies greatly in its toxicity, the most toxic being obtained from cases of achylia gastrica and from fetid diarrhea; (b) That heating the stool, in drying, above 45°C. markedly lessens its toxicity.

Stools, therefore, from a case of achylia gastrica were dried down in flat dishes in a specially constructed chamber through which a strong current of air was constantly forced by means of a rotary blower and the temperature maintained at 40°C. Liquid stools required as long as seventy-two hours continuous drying. The dried stool was pulverized in a mortar and weighed quantities of the powdered stool taken for the extract. A ten per cent. suspension was made in salt solution, stirred for thirty minutes to allow thorough solution and then filtered through a Berkfeld filter into sterile Erlenmeyer flasks. The toxicity of the extract was determined on guinea pigs before injecting the rabbits and non-lethal doses, 0.5 to 2 c. c. given subcutaneously, as it was found that intravenous administration was usually promptly fatal. The injections were given daily except when an animal was drowsy and refused food, when the injection was postponed until complete recovery from the previous injection. Animals dying in the first two weeks showed little, if any, lesions in the kidneys and their arteries were not examined, but the eight rabbits killed at the end of two months showed marked diminution in the cortical substance of the kidney while they had shown an albuminuria for ten days or two weeks previously. The kidneys removed from a rabbit treated similarly during the past summer, were examined by Dr. J. A. Lanford, Pathologist to Touro Infirmary, who reported as follows: "The cortex shows marked degenerative changes, being practically necrotic; the outline of the glomeruli and convoluted tubules remain, but the nuclei are absent and the microscopic picture is that of a granular pink-staining mass showing the outline of the cells but no nuclear material. Edema and congestion are quite marked. The structures of the medullary substance are unchanged either in their outline or component cells."

Realizing that these experiments are open to criticism they are offered only as presumptive evidence that intestinal putrefaction may be a causative factor in the production of cardio-vascular-renal disease, in the hope that some laboratory worker will become interested in the problem.

My clinical experience with cases of cardio-vascular-renal disease is even more convincing to me and I have collected a number of cases which will form the basis of a subsequent paper. These, I have classed as cases of toxic albuminuria, the toxic material coming from the intestinal canal and the condition clearing up promptly after overcoming the attendant intestinal toxemia. These cases have never had lues, or the infectious diseases and usually run a high phenolsulphonephthalein test. Among them are many cases of bacillary dysentery, the kidney complications of which have been noted by Savage[17], when he was in charge of the dysentery hospital at El Tor, in 1911. Bacillary dysentery is associated with the strongest indicanuria of any cases coming under my observation and the coincidence of the two is very striking, and again attracts attention to the influence of intestinal toxins.

I have time and again experimented upon patients with nephritis and have found that on a diet of even 125 gms. of protein with a negative indicanuria they would be albumin free, but on one with a protein

content as low as 50 gms. they would promptly show a heavy albuminuria, if the latter was associated with a heavy indican reaction. Moreover, patients who have become albumin free and whose 'phthalein reading has been as high as 50, after being allowed to run a heavy indican reaction for a week, have shown a 'phthalein reading of 20 to 30, which would rise slowly to the high level after a month or two of close observation of the intestinal canal.

It is in cases of arterial hypertension without demonstrable renal lesions that the influence of intestinal toxemia is most marked. Many such cases come to the internist on account of their rejection by life insurance companies who now require the routine taking of blood pressure. Some patients have come under my observation who had formerly been rejected for insurance on account of blood pressure as high as 220. I have paid attention solely to the intestinal toxemia found, with the result that they have since been granted large amounts of insurance, in one instance, one hundred thousand dollars, the blood pressure remaining constantly in normal limits and the vertigo and headaches having disappeared. It was such cases as these that were reported to you in 1911, and of the ones reported then in detail only one has died, the others enjoying good health up to the present. The progress of this fatal case is most interesting and shows the influence of mental strain upon patients suffering from cardio-vascular-renal disease.

The history was given in detail at that time as follows:

"Case 3.—Mr. N. E., white male, cotton factor, aged 58. At first examination blood pressure was 260. No palpable hardening of arteries. Headaches and vertigo for two years at frequent intervals. Severe nose bleed one year previously, with relief of symptoms. Heart normal and only moderately hypertrophied. Mental condition impaired and inability to speak correct words at time of first examination. Urine normal except for great excess of indican. Blood pressure reduced to 140 by low nitrogenous diet, abundance of water, moderate exercise, catharsis and three doses daily of sodium nitrite." The patient remained in excellent health with blood pressure 140 to 160 for thirteen months after condition quoted above and the nitrite was discontinued after a few weeks. Later he met with business reverses and worried to such an extent that he was unable to sleep. His blood pressure remained high in spite of the absence of indican and the administration of large doses of sodium nitrite. His heart began to dilate with subsequent albuminuria and he died two years later from edema of the lungs on account of dilatation of the right heart. He had never had any infectious disease, nor lues, and the only causative factor to be found was an intestinal toxemia extending over many years. It is impossible to state positively, but it is very suggestive, in view of the cases I have seen, that the constant action of the intestinal poisons had produced a myocarditis, with the result that the heart muscle was unable to stand the strain of hypertension brought on by mental anxiety.

The question of the influence of alcohol has not been dealt with, since it must be considered as a drug rather than a food. This holds true also for tea and coffee, which owe any deleterious effects they may have to the presence of caffeine, while they are often of distinct benefit in the treatment of certain types of cardio-vascular-renal disease.

SUMMARY

In closing it is with regret that I find it impossible to draw any definite conclusions regarding the role of food in the etiology of cardio-vascular-renal disease, but would prefer to summarize as follows:

1. In cases of cardio-vascular-renal disease intestinal toxemia may contribute to the severity of the symptoms and should be considered in the management of all cases.

2. The stools of man vary in degree of toxicity.

3. Extracts of human feces when injected into rabbits may produce changes in the kidney analagous to those found in cardio-vascular-renal disease in man.

4. Excessive protein food, irrespective of intestinal toxemia, overworks the kidneys and is at least a predisposing cause of cardio-vascular-renal disease.

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Editor's Note: This is the second paper of a Symposium on Cardio-Vascular-Renal Disease. The first one appeared in the January issue, two are in this issue, the other five, together with all the discussions, will appear in future issues.

SYPHILIS AS A FACTOR IN THE PRODUCTION OF CARDIO-VASCULAR-RENAL DISEASE*

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It is only in very recent years that we have awakened to the extraordinary prevalence of syphilis, and it is now becoming evident that the pale spirochete of Schaudinn rivals the acid-fast bacillus of Koch as a factor in the morbidity and mortality of civilized life.

A brief review of the published reports relating to the incidence of syphilis is nothing short of appalling. At the Peter Bent Brigham Hospital, in Boston, 15 % positive reactions were noted in making 4.000 Wassermann tests.[1] At Bellevue Hospital, in New York, the Wassermann reaction has yielded strongly positive results in over 25 % of the enormous number of serums examined.[2] At the Johns Hopkins Hospital, in Baltimore, an analysis of 2,376 admissions to the medical service showed 8.8 % of the whites and 37.6 % of the colored to have positive reactions in the blood serum.[3] In Richmond, among 2,449 patients, including white and colored, from the out-patient and in-patient clinics of the Medical College of Virginia, 44 % showed complete fixation, with an additional 12 % giving partial or incomplete reactions. In the psychopathic clinic of this college 42 % of incorrigible or backward school children show positive Wassermann tests.[4] From Birmingham comes the report of 18.8 % positive Wassermann reactions in 300 consecutive tests of private patients.[5] Finally, from the Medical Department of the University of Texas, at Galveston, appears a carefully analyzed report[6] showing that the incidence of syphilis among apparently healthy Negro adults in that community varies from 25 to 30 %, while in sick Negroes in the medical wards the incidence is from 40 to 50 %. That the infection is largely acquired is evident by a much smaller occurrence in Negro children under the age of puberty, only 9.5 %. This report further shows that the frequency of syphilis among the white people of the same social class as the Negroes is about the same as among the Negroes. In the better class of white people admitted to the medical wards, the incidence of infection averages about 20 %, while in the best class,—healthy young students,—it is almost nil.

It may be truly said that the subject of visceral syphilis is in evolution. The earlier pathological studies are incomplete, and at first sight it is difficult to reconcile with the serological findings the recent report from Bellevue Hospital, showing only 6.5 % of syphilitic lesions in 4,880 necropsies performed during the past ten years.[7] The great difficulty of recognizing syphilitic lesions post-mortem has been emphasized, and evidently overcome, by Warthin,[8] who has found evidence of active syphilis on microscopic examination in one-third of the adult cases coming to autopsy in the pathological service of the University of Michigan.

In his practical article on "The Four Common Types of Heart Disease," Cabot[9]

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finds, in an analysis of six hundred cases of hospital patients with failing hearts, that 12 % are due to syphilis. He also states that a more searching study might result in transferring some cases from the arteriosclerotic group to the syphilitic group.

Most unfortunately, there are no definite pathognomonic signs or symptoms of syphilitic involvement of the heart proper. The diagnosis must rest, in most instances, upon the discovery of a cardiac lesion which is not otherwise accounted for, and a positive response to the Wassermann reaction. If, however, we carefully consider the more recent pathological studies of the heart in syphilis and then recall the marked incidence of syphilis in general, we are at once forced to conclude that the proportion of heart disease due to syphilis is much greater than we are so far able to recognize on clinical grounds.

In a systematic anatomic study of the heart and aorta in fifty consecutive autopsies in cases of syphilis, Brooks[10] concludes that 66 % of his luetic cases, including both intelligently treated and incompletely treated patients, die as the result of or with serious circulatory disease apparently of specific origin. In this series of fifty cases the myocardium was found diseased to a serious degree in forty-four instances, and true cardiac gumma was present in five cases. In thirty-five instances disease of the coronary arteries was present to a relatively greater degree than the general arterial changes, including five striking cases seen in individuals under thirty years of age. This author mentions two cases where autopsy showed an aneurism of the aortic arch within six months after the initial lesion; also a case where death occurred before the secondary rash appeared, due to a minute perforation of the wall of the aorta just above the ring, associated with an acute arteritis and peri-arteritis throughout the myocardium. Three of his fifty cases showed cardiac aneurisms.

Warthin's experience,[11] based upon the examination of two hundred hearts from syphilitics (50 congenital cases and 150 cases in which the disease was acquired), leads him to believe that syphilis, both congenital and acquired, is the most important etiological factor in the production of cardiac disease, both myocardial and endocardial. He finds that the cardiac localization of the spirochete is more common than the hepatic, and that the organism may be found in great numbers in the heart when no others can be found elsewhere in the body.

In a second detailed report[8] of forty-one autopsy cases that showed active syphilis upon microscopical examination, Warthin demonstrated specific lesions in the heart in thirty-six and in the aorta in thirty-two. It is of special significance that in these forty-one cases the existence of syphilis was denied or unsuspected in twenty-five, clinically cured in eleven, and clinically active in only five.

The predilection of syphilis for the vascular system is noted almost from the inception of the disease in the involvement of the cutaneous vessels at the point of inoculation. Here the pathological process consists of an endarteritis, and later a panarteritis with a characteristic inflammatory infiltration. Excepting the macule, all the lesions succeeding the chancre show a marked affection of the vessels, especially those of the late secondary and tertiary stage.

Syphilitic arteritis involves especially the aorta, the cerebral, pulmonary, subclavian, femoral and popliteal arteries. The most important vascular lesion of syphilis is undoubtedly the specific inflammatory disease of the aorta. The demonstration of the spirochete in the aortic wall in both acquired and congenital syphilis and a positive Wassermann reaction in nearly 80 % of the cases definitely places aortitis in the category of active syphilis.

Fordyce,[12] quoting Lenz, states that in the larger cities 25 % of all syphilitics die from aortitis (angina pectoris, aortic insufficiency, aneurism) as against 3 or 4 % from paresis, 1 to 2 % from tabes, and 10 % from all other syphilitic affections, as of the brain, liver, etc. The infection of the aorta probably takes place during the secondary stage, but, with few exceptions, the process usually remains latent or unrecognized for an average of sixteen or seventeen years. With the development of symptoms in syphilitic aortitis the disease runs a rapid course and death ensues in two or three years. In many

instances this can be attributed to extension of the process to the aortic orifice with its resulting sclerosis and deformity of the aortic valves.

The early symptoms and signs of syphilitic aortitis, in addition to a positive Wassermann reaction, are precordial pain, slight dyspnea, attacks of paroxysmal dyspnea and angina pectoris, cardiac hypertrophy, increased pulsation of the vessels of the neck and the physical and Roentgenographic signs of dilation of the aorta (Longcope[13]). Later in the disease the condition is generally made apparent by the signs due to aneurism or sclerotic aortic valvulitis.

Even in untreated or neglected syphilis, involvement of the aorta is a late event. It would be presumed that treatment is a highly important factor in the prevention of syphilitic aortitis. Many writers, however, have emphasized the relentless nature of the affection. Symmers[14] records a case coming to autopsy in which the patient, himself a physician, had been under intelligent anti-syphilitic treatment for three years and yet the aorta presented numbers of sacculated aneurisms and was an exquisite example of syphilitic aortitis from commencement to bifurcation. This author's statistics demonstrate that syphilitic aortitis is a lesion of comparative youth, nearly three-fourths of his cases occurring between the ages of thirty and fifty years. They also show that 30 % of these cases develop aneurism, 15 % dilatation of the first portion of the aorta, and that 30 % result in sclerosis and retraction of the aortic valves.

Syphilitic disease of the innominate, carotid and subclavian arteries may be attended by symptoms simulating intermittent claudication of the lower extremities, together with weakness, radiating pains and sensory disturbances. Periodic or continuous headache, often with vertigo, is said to accompany involvement of the left carotid artery. When the coronary arteries are the seat of the disease, the attacks are anginal in character. Of 270 cases of angina pectoris collected by Anders,[15] 26.5 % gave evidence of syphilis.

The relation of syphilis to arterial hypertension has been emphasized by a few writers, but especially by Stoll.[16] Subsequent studies very promptly showed that conclusions based upon the luetin test were fallacious in as much as this intradermal reaction is almost invariably obtained in any individual, whether syphilitic or not, if potassium iodid is administered before, during or shortly after the test is applied.[17]

Among the 4,000 cases submitted to a Wassermann test by Walker and Haller,[1] there were 120 cases of chronic nephritis with hypertension, and of these only seven gave a positive reaction. Very recently Janeway[3] has made a special study of the possible influence of syphilis in the causation of hypertension. In 320 patients the incidence of the Wassermann reaction was less than for all patients in both white and colored series. In uncomplicated hypertension cases only 0.9 % of the whites and 16.6 % of the colored gave positive findings in the blood serum. These figures lend no support to the view that family hypertensive cardio-vascular disease is familial cardio-vascular syphilis.

The attempt has been made to identify certain cases of parenchymatous nephritis with syphilis of the kidney, but the evidence is for the most part indirect and inconclusive.

In passing may be mentioned the report of Stengel and Austin[18] who, basing their work upon the investigations of Munk, call attention to the peculiar relation between nephritis in syphilitics and the presence in the urine of peculiar doubly refractile lipoids.

In conclusion, time permits of just a few words dealing with treatment. It must be emphasized that the clinical evidence of cardio-vascular syphilis is almost always a late manifestation of the infection. In spite of the isolated cures and the occasional brilliant recovery of the syphilitic cardiopath on specific treatment, the disease too often pursues a relentless course to the fatal termination. Such being the case, physicians must appreciate the serious responsibility of the treatment of early syphilis in the wisest manner possible. As Fordyce[19] says, it can not be emphasized too frequently or too energetically that the fate of the syphilitic individual depends largely upon the

early diagnosis of his infection and the intensity with which his treatment is carried out in the first six months. It seems superfluous to insist that the secretion of all venereal sores should be searched for the spirochaeta pallida. In this way a positive diagnosis can be made before the Wassermann reaction becomes positive or any secondary symptoms appear. The great advantage of early treatment in all cases of syphilis and consequently the more favorable prognosis are too obvious for discussion.

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Editor's Note: This is the third paper of a Symposium on Cardio-Vascular-Renal Disease. The first one appeared in the January issue, two are in this issue, the other five, together with all the discussions, will appear in future issues.

A SIMPLIFIED TECHNIC IN THE APPLICATION OF SCHICK'S REACTION FOR TESTING IMMUNITY TO DIPHTHERIA*

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Schick, in 1913, working in Von Pirquet's Clinic, in Vienna, described a skin test by means of which the presence or absence of antitoxin in the blood of tested individuals could be determined. From data already collected it is evident that this test, either in the present form or some subsequent modification, will become part of the routine of clinical medicine.

The test presents three main uses. The first one is in testing persons for natural presence of antitoxin, particularly when they have been exposed to infection; secondly, in determining the degree of immunity obtained following injections of antitoxins; and, lastly, in aiding in detecting the carrier state.

The test depends upon the reaction of nonimmunes to an injection of diphtheria toxin, the amount of which is a one-fiftieth minimum lethal dose for a 250-gram guinea pig. The toxin is a direct irritant to the skin if there is little or no antitoxin circulating in the blood to neutralize the toxin injected.

It has been determined that if an individual should have more than 1-30 of a unit of antitoxin in 1 c. c. of blood serum, then that person is immune to the Klebs-Loeffler bacillus. In other words, the test consists of a definite amount of toxin of such a strength that a negative reaction would be obtained if the blood serum contained as much as 1-30 of a unit of antitoxin.

From the result of the studies of Schick, Park, Kolmer, Mashage, and many others, they found that many individuals, without ever having shown symptoms of a diphtheritic infection, already possess antibodies. The age plays a great part regarding susceptibility. In the new-born about 80 % contain a sufficient amount of antitoxin in their blood to be immune. The greatest period of susceptibility to the disease is from the end of the first to the end of the fifth year, during which time from 50 to 60 % of the children contain a sufficient amount of antitoxin in their blood to be rendered insusceptible to diphtheritic infection. After this period the percentage gradually rises until among adults about 90 % will be found to be immune. The reason that so high a per cent. of grown people possess an immunity is explained by the fact that they have already had the disease, or had mild, unrecognized attacks, producing immunity, or being subjected for periods of time to the continued action of the Klebs-Loeffler bacillus without having actually developed the disease. This latter explanation is especially borne out in the cases of doctors

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and nurses in infectious disease hospitals, in which practically all of them are immune. In some the amount of antitoxin present is exceedingly high; as much as 10 units per cubic centimeter, and even higher than this, have been recorded. Ordinarily a blood containing 1-30 of a unit of antitoxin to the c. c. of blood is considered immune. But this does not hold in case the organisms are of exceptionally high virulence, in which case infection might take place with a production of a usually mild infection. This will probably explain the recurrence of diphtheria among persons ordinarily insusceptible to it during certain very severe epidemics.

In children who are taken sick with diphtheria there are no protective bodies in the blood, or not in sufficient quantities, and these are found to give the positive test. Diphtheria carriers, as a rule, give negative reactions. Some of these individuals are found to contain large amounts of antitoxin in the blood.

It is interesting to note that not only do certain individuals vary greatly in their reaction to the Schick test, but that groups of persons forming families vary as groups. Park has called attention to a curious fact in relation to children of the same family. If the youngest child in the family is negative, it will be found that the reaction will be negative in all of the other children; if any react positively, they are all apt to give the same reaction; while if there are any variations, the older children will be found negative, while the younger children will be found positive.

Park also called attention to the fact that children suffering with scarlet fever are highly susceptible to diphtheria. He found that scarlet fever reduces the resistance to diphtheria as shown by the fact that a much higher per cent. would give a positive reaction; and, furthermore, were an antitoxin to be given to a scarlet fever case, the total destruction of said antitoxin would take place in 10 % of all cases in ten days' time.

The test may be used for determining the length of time for which immunity persists after the injection of a dose of antitoxin. It has been found that the antitoxin begins to disappear from the blood after the lapse of ten days, and that it has practically all disappeared after four weeks' time. Individuals who have had the disease do not necessarily carry antitoxin in their blood even one month after recovery, as shown by the tests made at the Williard Parker Hospital, in which eight cases had had the disease about four months prior to the test; only one gave a negative reaction, while the other seven were positive to the Schick test.

Moffett and Conrad have called attention to another use of the test, that is, to differentiate between doubtful membranes of the throat. In cases in which there is a membrane and also a positive Schick reaction, it can be assumed that the disease is diphtheria; but if the Schick reaction is negative, the membrane will probably be found to be due to some other organism.

The test has its greatest usefulness in combatting severe diphtheria epidemics. The measures most commonly employed in the fight against such epidemics are throat and nose swabs, quarantining or isolation, as the case may be, of those from whose throats cultures of diphtheria bacilli are obtained. It is, therefore, plain that such methods are unsatisfactory. They do not at all meet the exigency of the occasion. Schick's test, however, answers all the requirements in that it points out all those individuals who are susceptible, who do not have sufficient natural immunity, and these may be then given a prophylactic dose of antitoxin. In this case it makes no difference if the individuals exposed can not be isolated, and it saves the expense of injecting all, as a good number will have natural immunity enough to protect them.

PRESERVATION OF THE TOXIN

It is a well known fact that the diphtheria toxin is exceedingly prone to deterioration even in its native state. The ordinary refrigerator is not sufficiently cold to answer the purpose unless the toxin be placed on ice, which is not generally done. Many drug stores have no refrigerators. Hence the toxin is subjected to the ordinary room temperature. Such a temperature will speedily cause disintegration of the product. In performing the Schick test it is therefore imperative that the toxin should be of a definite and

exact strength. Any deterioration of the same would render the test fallacious.

An effort has been made by the author to preserve a toxin so that it can be rendered stable within a reasonable time when subjected to ordinary room temperature. Many experiments which will be given in another paper were made by adding various chemicals to the toxin, but most of them either destroyed the potency or obscured the true reaction of the test when the extracutaneous injection was made. The chemicals were therefore abandoned. Dessication of the toxin was next taken up with the result that it proved satisfactory. Covering the toxin in its native state with toluol or sterile liquid albolene is also quite satisfactory. Experiments showed that the dried toxin in a vacuum were apparently the most stable. The next best and perhaps the most practical was the dried toxin to which was added two cubic centimeters of albolene or toluol. The vial into which the toxin was placed was previously heated to drive off the moisture and allowed to cool to 60° C. Then the dried toxin was introduced with the albolene or toluol; the rubber stopper was applied; and the whole was immersed in cold water. This latter method renders the toxin quite stable for six weeks at room temperature (60 to 70° F.). It is stable for more than eight months at 48° F., which is the temperature at which all authorities advise it should be kept.

AUTHOR'S TECHNIC

This method of applying the test is one which requires no special technic that is not easily acquired by any physician. The necessary articles are a 1-c. c. hypodermic syringe graduated in tenths, a No. 26 or 27 gauge needle, sterile normal salt solution, and the diphtheria toxin prepared according to the method as outlined above. The toxin is diluted in the salt solution according to the strength as determined by laboratory tests. The amount of the solution should be so made that approximately 0.2 c. c. will be the amount, as it makes a good sized bleb.

The modified outfit for diluting the toxin to the proper strength consists of only two vials. One vial contains the physiological salt solution and the other one contains the diphtheria toxin. All the physician has to do is to pour the salt solution into the vial and shake it. Two-tenths (2/10) of a c. c. of this solution is the proper dose for the test. This can be drawn up with a 1-c. c. hypo. graduated in tenths, carrying a 26 or 27 gauge needle.

The injection should be made into the skin (intradermal) and not subcutaneously. This is easily accomplished if a small bit of the skin is held tightly between the thumb and forefinger of one hand and the barrel of the syringe in the other is held lower than the needle point. The reaction, if positive, is shown by an area of inflammation varying in extent from 2 to 5 cm. (2-5 to 1 inch) in diameter. It is more intense in the center and lasts for about ten to fourteen days, when it gradually disappears, leaving a brown desquamating surface. Those giving such reaction, are susceptible to diphtheria while those who do not, have a natural immunity which is adequate to protect them.

PSEUDOREACTION

Park and others have described a few cases which give what they call a "pseudoreaction," which is characterized by a less sharply circumscribed lesion, which comes on earlier and disappears in from twenty-four to forty-eight hours, leaving a slightly pigmented spot, which does not scale. These reactions have been thought to be due to a local anaphylaxis due to the protein content in the bouillon medium.

The time at which the reaction is to be read is a matter of considerable interest. When time permits, it is better to read the reactions after forty-eight hours than after twenty-four hours, although in the presence of exposure to diphtheria it may be advisable and necessary to inspect the reactions and immunize non-immune or positively reacting persons at the end of twenty-four hours. In these questionable cases it is always better to give the patient the benefit of the doubt if he has been exposed to diphtheria and immunize him at once if the reaction is present. The proportion of individuals giving these pseudoreactions is so small that the giving of antitoxin to them would not seem to present any obstacle to the application of the tests.

CONCLUSIONS

1. It is evident that a simplified technic for the application of Schick's test is needed for the average practitioner.

2. By the employment of the technic as outlined it is believed that it can be acquired by almost any physician.

3. The preservation of the toxin is an all-important feature of the test, since a deteriorated toxin will give fallacious results.

4. Schick's test is of inestimable value in the following conditions:

(a) By this test we now have a means of quelling diphtheria epidemics which is practical, efficient and available to any physician.

(b) It will obviate the necessity of giving antitoxin to about 50 % of persons coming in contact with diphtheria infection, thereby lessening the great yearly expenditure for unnecessary antitoxin.

(c) It shows a striking similarity in reaction in families and indicates that immunity is a family condition. This saves a great number of persons the injection of serum, with its discomfort, sensitization, and expense.

DISCUSSION

Dr. J. E. Paullin, Jr., Atlanta, Ga.—Dr. Litterer has made a very useful and a very valuable contribution toward the determination of individual susceptibility to diphtheritic infection by preparing the diphtheritic toxin in such a way that its strength will remain constant, the dosage is accurate, and the solution easy to prepare. As he has well said the only objection to Shick's test is the rapid deterioration of the diphtheritic toxin when it is not kept under certain conditions. The conditions necessary to keep the toxin from deterioration are such that make it difficult for the practitioner in small towns to make use of this most valuable test. By employing the dried toxin after the manner as outlined by Dr. Litterer, this greatest and practically only factor which in times past has made Shick's test questionable in many instances, has been overcome. All authorities well agree that for determining the individual susceptibility of those exposed to diphtheritic infection, Shick's test is of the greatest value.

In schools, in orphan asylums, in the children's ward of large hospitals, by making use of this test it is a very easy matter to determine beforehand the children who will contract diphtheria in the event exposure occurs. In the majority of large hospitals this test is a routine procedure before the child is admitted to the regular children's ward. In an epidemic in an institution it is possible to tell among those who have been exposed to the infection within twenty-four to forty-eight hours whether or not all are susceptible of contracting the disease. In former times we had to rely upon the making of cultures from all throats of those exposed, or to wait the development of the disease in those exposed, or give the exposed children prophylactic doses of diphtheritic antitoxin. The taking of cultures in a large number of throats is not an accurate procedure, and in the event of exposure the infection might develop in the nose before it does in the throat, and as few cultures are ever made from the nose the disease might in this way escape recognition. The procedure is still further at a disadvantage in the smaller towns where there are no immediate laboratory facilities for the detection of this disease, —in such an instance a culture is made and sent to the nearest laboratory, and in about four days the physician receives a report at the time that particular culture was made from the child's throat, without knowing what has occurred in the throat in the three days intervening between the time of the cultures and the receipt of the report.

Again I would say that the contribution is most useful in that Dr. Litterer puts in the hands of the general practitioner the means of accurately diagnosing susceptibility that he has not as yet had.

Dr. L. W. Elias, Asheville, N. C.—This is a subject in which I am extremely interested, and one so important that it would be unfortunate if we allowed the impression to go out that this test is as simple as the essayist would have us believe. He spoke of the test as being so simple that any one could interpret the findings with accuracy and without making any mistakes. Probably this is taking too optimistic a view of the subject. Having had the test made on myself by Dr. Zingher, of New York, and he being unable to tell whether there was a positive or a pseudopositive reaction, makes me believe that we can not always interpret the findings correctly. This is to be remembered simply in the interest of accuray.

When I mentioned the subject to Dr. Place, in Boston, he showed me two reactions on his arm and asked whether I would call them positive or negative. They looked positive to me; he thought they were positive, too. "But," he said, "I am exposed 3,500 times a year and never take diphtheria. Is there any significance to it?" He thought not and turned it down. Further investigations, however, have proved the great accuray of the test; in spite of the fact that there are occasional pseudoreactions that the best men can not interpret, which fact should be remembered merely to check our conclusions.

One other point with reference to the making of the solution. I tested an entire family and every one was as negative as could be. However, in a week's time one child had a virulent attack of diphtheria, both clinically and by laboratory findings, the only case I ever saw where the glands suppurated. In this case my mistake was in diluting the toxin with a salt solution that was very hot.

We get more accurate results by remembering the source of possible errors. And the test is capable of such usefulness that it should be employed as frequently and carefully as possible 'till we are able to give our patients the fullest benefit from it.

Dr. Allen H. Bunce, Atlanta, Georgia.—I would like to mention an experience in the Agnes Scott College. About two months ago three or four girls developed diphtheria. They had a positive culture as shown by the State Board of Health. Shortly thereafter three or four more girls developed positive cultures and the resident physician (Dr. Sweet) decided to do the Schick test on the members of the faculty and the students. So she proceeded to do the test on members of the faculty with the result that about ninety per cent. of the adults showed a positive reaction, whereas ordinarily we would suppose that ninety per cent. of adults would be insusceptible to diphtheria. Dr. Claude Smith, City Bacteriologist, and I were called to the Agnes Scott College to see some of these cases and to discuss what should be done. In view of the fact that about ninety per cent. of the adults gave a positive reaction, whereas ordinarily we would suppose, at least, that percentage should be negative, we decided the best thing to do was not to give antitoxin except to those cases showing clinical diphtheria. Ordinarily, in taking cultures, where we have an epidemic, we have a group of positive cultures in clinically negative cases.

In West Point, Georgia, near Alabama, about two months ago I had occasion to examine school children. We examined 400 school children and found 75 positive. We did not do the Schick test. Why? For the simple reason that in our experience we found such a large percentage of the positives that we did not deem it advisable to give antitoxin except in clinical diphtheria, or to those who had been exposed to severe cases. We found a great number of children were positive, carrying diphtheritic bacilli in their throats without having clinical diphtheria in the ordinary sense of the term. In other words, we thought it best merely to isolate these cases and watch them without giving antitoxin and without performing the Shick test, as the experience we have had determined the fact clearly, that in a given epidemic of diphtheria in a community, where the people come in close contact with each other, as in schools, the best thing to do is to isolate the cases having clinical diphtheria, give them antitoxin where they show marked symptoms, and not give antitoxin otherwise.

If you follow the Schick test you give antitoxin to nearly ninety per cent. of adults where there is no evidence of the disease, and where they will not develop the disease. Where we have clinical diphtheria, let us give antitoxin whether or not we have a positive culture the first time since frequently we may have to make two or three cultures before we get a positive. Isolate the positive cases, give them antitoxin when indicated, and also isolate the carriers so far as you can.

Dr. Wm. Litterer, Nashville, Tenn. (closing).—I appreciate very much this free discussion. I will first take up the remarks made by Dr. Bunce. I may say at the outset, that no other laboratory worker, or clinician, has ever obtained any such results as ninety per cent. of positives in adults, as obtained by Dr. Bunce. The reverse is the invariable rule. This great discrepancy is undoubtedly due to faulty technic, caused by too much of the diphetheria toxin being employed in the Schick's test. A positive Schick's may be obtained in any one if you get more than one-fiftieth of the minimum lethal dose.

Last year we had an epidemic at the Orphan Asylum, the disease having occurred in one wing of the department with about 100 individuals. We found that seven persons had already developed the disease. We simply made the Schick test and did not quarantine a single patient. We gave antitoxin to about fifteen which were the number that gave a positive Schick's test. The others were negative and no anti-toxin given. The cases of diphtheria were right there with healthy individuals that gave a negative reaction. Not a single case developed diphtheria. The epidemic was quickly quelled. In the Willard Parker Hospital of New York, they employ the same method as outlined, with phenomenal success. Thousands of tests have been made with uniform results. The very high positives results obtained by Dr. Bunce cannot be attributed to any other factor than that of some fault in technic.

With reference to the pseudoreaction referred to by Dr. Elias, will say that, I have fully discussed that phase of the subject in my paper. I take the position that if there is any possibility of a reaction, true or false, we should give diphtheria antitoxin. There is undoubtedly a pseudoreaction as shown by Dr. Park, but those reactions are comparatively rare. Concerning the question of stability of the toxin after dilution, that a deterioration will take place in about twelve hours. It should be given just as soon as possible or certainly within a few hours after dilution is made.

ARTIFICIAL PNEUMO-THORAX A PLEA FOR PARTIAL COMPRESSION*

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The possibilities of artificial pneumothorax are wonderful. Each year as the accumulated experiences of the many who are applying this measure are taken into account and our knowledge becomes more and more enriched thereby, it is to be hoped that artificial pneumothorax will survive as an every-day resort in pulmonary surgery long after its use in pulmonary tuberculosis will have been superseded by an early cure. This procedure is not now confined merely to the treatment of tuberculous lungs. Duval[1], of France, extracts projectiles from the lungs of wounded soldiers by first producing total pneumo-thorax. He

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then palpates the lung, locates the foreign body, makes an incision into the lobe in which the foreign body is located, removes the foreign body, sutures the wounded lobe, closes the chest cavity, and later removes the intrapleural air by puncture. This operation has been done upon more than twenty patients with only one death. The patients are up and about a week after the operation and are discharged from the hospital at the end of two weeks. H. Ebert[2], of Germany, attributes a hundred recoveries from gunshot wounds of the lungs to his treatment and management of all such cases by inducing artificial pneumo-thorax, in this way ridding the lung of secretions, controlling the bleeding and preventing adhesions. We will see then that this procedure is coming into its own in the treatment of congestion, hemorrhage and trauma of the lung, as well as tuberculous infection.

The object of this paper is to bring out the point which seems to the author as wholly rational after a study of his own cases and conclusions arrived at by the study of the experiences of others. We must consider rest the prime factor in achieving results. Rest,—by that we mean complete rest,—to the lung or any other part, is necessary in order to make headway in arresting the progress of tuberculous infection. It is a simple matter to apply a splint to a joint and absolutely limit motion at that point; quite another thing to obtain complete rest on the part of a lung. We must consider that this organ expands and contracts about twelve thousand times every twenty-four hours during life. In order absolutely to limit its activities it would seem necessary to obtain a complete collapse of the lung and maintain it over a period of months. This has been the aim of every operator since the procedure was first introduced by Forlanini.

Since this is a surgical procedure, it should be viewed from a surgical standpoint. We men who are most interested in applying artificial pneumo-thorax are medical men. That no doubt has been a handicap in affording us unbiased judgment as to the best technique in applying pneumothorax in such manner as to be most beneficial to the patient. Is it necessary to destroy the whole lung function as well as virtually to destroy the lung itself in order to arrest the disease within it? The modern thing in surgery is to preserve life and limb both, and if possible to restore functions.

All of you who have had occasion to examine a lung at post mortem that has been in a state of complete collapse over a period of six months or more, can hardly conceive that such a lung could ever perform its normal function or even return to a semblance of its normal state. We need only refer to the pathology of such lungs as is set down by Forlanini, Saugman, Warnecke, Kistler and others. They have found the following: "When collapse has been complete the lung is a firm mass lying close to the spinal column. Histologically the following conditions are found: First, the most striking change is an extreme fibrous tissue formation. This has been noted in every instance and occurs to a degree never observed under other conditions. Bronchi and alveoli are compressed, and the scattered alveoli imbedded in the connective tissue give the organ the appearance of a gland. The overgrowth of connective tissue is more marked in the situation where compression has been complete, than in portions of the lung that have been prevented from collapsing by adhesions. Secondly, the epithelium of the alveoli has been transformed and become cuboidal or columnal in type. They conclude that the tendency to dense fibrous tissue proliferation is due almost entirely to the altered circulatory conditions in the lung."

Evidence goes to show from the vast experience now accumulated that a completely collapsed lung, even over a very short period of time, does not resume its normal function entirely. Brodie and MacKenzie[3] recently showed, by measuring the residual air and dead spaces, employing both the CO_2 method and the hydrogen method and also the volume of the circulation through the lung using Krough's nitrous oxid for the purpose, that patients recovered from traumatic pnuemo-thorax presented a very considerable limitation of function on the injured side.

In the face of the facts already tabulated, we will therefore take it for granted for the most part that a completely collapsed lung, over a long period of time, will be of little further use to the patient.

Many will say that it is better to have no lung than to have it actively tuberculous. On that we will all agree, but there may come a time, and quite often it does come, when after a lung has been completely collapsed, greatly to our satisfaction and apparently to the patient's welfare, suddenly the other lung lights up and becomes progressive. In such a case there would seem no other way than again to resort to pneumo-thorax, in which case it could only be administered with great care and small advantage to the patient. After the complete obliteration of the opposite lung, complete collapse of the remaining one, you will quite agree, is out of the question.

Early in our experience we had occasion to apply pneumo-thorax in a case of excessive recurrent hemoptosis. The operation was done while the patient was bleeding. One hundred cubic centimeters were introduced and the hemorrhage stopped immediately. On account of the critical condition of the patient, no attempt was made to introduce more at that sitting. This made quite an impression and we remarked at the time upon so slight a pressure's having stopped the bleeding. The result in this case was permanent and the patient is alive and well after many months. On account of this experience we have always noted in subsequent cases that 100 to 200 c. c. are all that have been required to control hemorrhages. Dr. Foster, of Colorado Springs, recently assured me that his experience had been the same.

We also noted in our early experiences that the majority of our complete collapses were later followed by pleural effusions; and these in turn were followed, in not a few instances, by considerable deformity, and later by acute activity in the opposite lung. Pleural effusions worried us a great deal at first. Later, however, we came to feel that they were almost to be welcomed rather than to be feared, as they did the work of splinting the lung and saved the patients many refills. I feel now, however, that we should do all we can to prevent the occurrence of excessive effusions, as the bringing on of another pathological condition, trusting to it to care for the primary lesion, would seem to be a very unscientific way of assisting the patient and excusing the accident.

We must know that the great benefit derived from the induction of artificial pneumo-thorax is not due alone to immobilizing the lung. True this is a prime factor, but we should not overlook the fact that we produce at the same time a passive venous hyperemia, which is of great value in raising the resistence of the tissues to infection by the tubercle bacilli. This venous hyperemia is markedly reduced when the lung is in complete collapse as Burns has conclusively shown that the amount of blood in a collapsed lung has decreased a few hours after pneumo-thorax has formed and becomes less and less as collapse proceeds. It is not the mere compression of the lung that arrests the clinical phenomena of phthisis, such as fever, night sweats, etc. This is brought about by impeding the flow of lymph from the lung which automatically prevents the absorption of toxic material in such large quantities from the diseased tissue.

Having recognized these things, after measuring our own experience and severely criticising all literature on the subject, we determined to try to obtain the same results by partial compression that we had obtained, and that others have obtained by complete collapse. We find that the clinical symptoms disappear in most cases as readily in partial collapses as in complete collapses. We find that the patient's general condition improves in turn just as readily. We also find that the sputum is reduced just as surely but not so quickly. I have cited the results in hemorrhage cases by the use of light compression. We also note that by partial compression we greatly limit the activity of the lung, thereby producing more than an appreciable immobilization without rendering that lung unfit for the performance of its function at a future time.

The disadvantages of partial collapse are few. They are as follows:

First. Refills are necessarily more often.

Second. These patients must be studied and examined very closely, both by physical examination and the fluoroscope in order to determine the time for refills.

Third. The frequency of the refills requires only that one be careful of his technique, as the more often the pleura is entered, the more liability there is to infection, air embolism and pleural shock. Air embolism and pleural shock scarcely need

be taken into account, because air embolism will not occur if the air is not turned on until the oscillations of the manometer so indicate. Pleural shock is prevented by local anesthesia. The only thing left then is infection; and here again we medical men doing this operation must become modern surgeons in the strictest sense of the word.

I will quite agree that there are cases where nothing less than complete collapse will suffice. Fortunately, however, since we have resorted to partial collapse, we have encountered no such cases.

The advantages of this method are:

First. The results are the same clinically.

Second. Partial collapse may be used alternately in either lung or at the same time in both lungs, if the case so demands.

Third. There is less tendency to pleural effusions.

Fourth. There is very little strain thrown upon the right heart.

Fifth. There is no disturbance of the mediastinum.

Sixth. There is less danger of spontaneous pneumo-thorax.

Seventh. There is less danger of rupturing an abscess into the pleural cavity.

Eighth. When the disease is arrested we have the unaffected portion of the lung performing its function.

For the reasons already set forth as well as the highly satisfactory clinical results obtained, we can see no reason for other than partial collapse of the lung except in extreme cases.

REPORT OF THE COMMITTEE ON UNIFORMITY IN THE WASSERMANN REACTION*

At the request of the members attending the Section on Medicine at the Dallas meeting of the Southern Medical Association, the Chairman, Dr. K. H. Beall, appointed a committee for the purpose of recommending a technique to be used in performing the Wassermann test which would give uniform results. The following members of the Association were named as members of this committee:

Dr. Albert Keidel,
Dr. Lloyd Thompson,
Dr. J. A. Lanford,
Dr. H. L. McNeil,
Dr. William Litterer, and
Dr. Chas. Watterston.

Dr. Keidel, after a lapse of several months, resigned. Drs. Thompson and Lanford failed to attend the meetings of the committee and therefore automatically became inactive.

The first meeting of this committee was held in Nashville, Tenn., on July 1, 1916. Various methods of procedure were discussed. At the suggestion of Dr. Litterer it was decided to exchange sera for the purpose of noting any variation in the result of our work, and Dr. McNeil at the same time proposed that we proceed gradually to the uniform test so that we could learn from experience the exact amount of variation and the causes thereof.

Our work was to be divided into three series, the first of which would consist of fifty or more sera, each worker to use his own technique and his own antigen.

The second was to consist of fifty or more sera to be examined with a uniform technique, but with an antigen which was to be the product of each individual laboratory.

Series three would consist of fifty or more sera to be examined by means of a uniform technique and a uniform antigen.

Dr. McNeil was to use in his examination a human hemolytic system. Dr. Litterer and Dr. Watterston were to use the sheep hemolytic system, and an alcoholic extract was used as an antigen.

Coincidentally each laboratory employed the same antigen, that is as to name, but in each instance they were prepared according to an individual formula.

The antigen designated as "Antigen-A" on the accompanying charts is an acetone insoluble lipoid, and the antigen designated as "Antigen-B," is fortified with a certain amount of cholesterin; but with the exception of the antigens in series three they are, as was said in another part of this paper, the product of each individual worker.

For a uniform technique to be used in

*Read in Section on Medicine, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

series two and three the sheep hemolytic system was selected with definite units of quantity and volume, and the watery extracts and alcoholic extracts of syphilitic tissue used as antigen were replaced by the acetone insoluble lipoid designated in the accompanying chart as "Antigen-A" and the cholesterin fortified antigen made from human heart which is designated as "Antigen-B."

All sera were prepared for shipment by placing them in sterile tubes and inactivating. The cerebro-spinal fluid was not inactivated, but was shipped and examined without the process of inactivation.

Serum sent to Dr. McNeil, who is located at Galveston, Tex., and the serum sent by him to the other members of the committee were necessarily on the road two days, which possibly caused some change in their reacting power. In fact, several batches were entirely discarded, being too anti-complimentary for examination.

In this connection we wish to impress upon every one performing the Wassermann test the necessity of controls of the patient's serum and the antigen, for an anti-complementary serum is frequently found, especially if the blood or serum is sent a long distance by mail.

It will be seen from Charts I and II that the first series consisted of fifty-four sera and that while there is apparently considerable variation in results, the members of the committee agree as to the positive or negative results in 74 % of all cases and that one or more reports read contradictory to the others in 26 % of all cases.

This is about the usual result when examinations are conducted under conditions such as these.

A slight variation in our results exists in nine and twenty-five one hundredths per cent. of the sera examined; but this is really a factor of lesser importance, for the main question is, whether a given serum is positive or negative. In the estimation of the members of this committee it would be better to report a given serum as positive or negative, for although it is rare to find a serum which will change

INDIVIDUAL TECHNIQUE - INDIVIDUAL ANTIGEN.
Series 1 - 1 to 27

	Watterston		Litterer		McNeil	
Antigen	A	B	A	B	A	B
Serum 1	—	—	+ +	+ + + +	—	—
" 2	—	—	—	—	—	—
" 3	+ + + +	+ + + +	—	+ + + +	+ + + +	+ + + +
" 4	—	—	—	—	—	—
" 5	—	—	—	—	—	—
" 6	—	—	—	—	—	—
" 7	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 8	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 9	—	—	—	—	—	—
" 10	—	—	—	—	—	—
" 11	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 12	—	+ + +	—	+ + +	—	+ + +
" 13	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 14	—	—	—	—	—	—
" 15	—	—	+ +	+ + + +	—	—
" 16	—	—	—	—	—	—
" 17	+	+	+ +	+ + + +	—	+
" 18	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 19	—	—	—	—	—	—
" 20	—	+	+	+ + +	+	+ + + +
" 21	—	—	—	—	—	—
" 22	—	—	—	—	—	—
" 23	—	—	—	—	—	—
" 24	—	—	—	+	—	—
" 25	—	—	—	—	—	—
" 26	—	+ +	—	+ +	—	+ +
" 27	—	—	—	—	—	—

INDIVIDUAL TECHNIQUE - INDIVIDUAL ANTIGEN.
Series 1 - 28 to 54.

	Watterston		Litterer		McNeil	
Antigen	A	B	A	B	A	B
Serum 28	—	—	—	—	—	—
" 29	—	—	—	—	—	—
" 30	—	—	—	+ +	—	—
" 31	—	—	—	—	—	—
" 32	—	+	—	+ +	—	+ +
" 33	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 34	—	+ +	—	+ + + +	—	+ +
" 35	—	—	—	—	—	+ + + +
" 36	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 37	—	—	—	—	—	+ + + +
" 38	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 39	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 40	+ +	+ +	—	—	—	—
" 41	—	—	—	—	—	—
" 42	—	—	—	—	—	—
" 43	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 44	—	—	—	—	—	—
" 45	+ + + +	+ + + +	+ + + +	+ + + +	+ +	+ +
" 46	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 47	—	—	—	—	—	—
" 48	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
" 49	—	—	+ + +	+ + + +	—	—
" 50	+ + + +	+ + + +	+ + + +	+ + + +	—	—
" 51	—	—	—	—	—	—
" 52	—	+ +	—	+ +	—	—
" 53	+	+	+	+	+	+
" 54	—	—	—	—	—	—

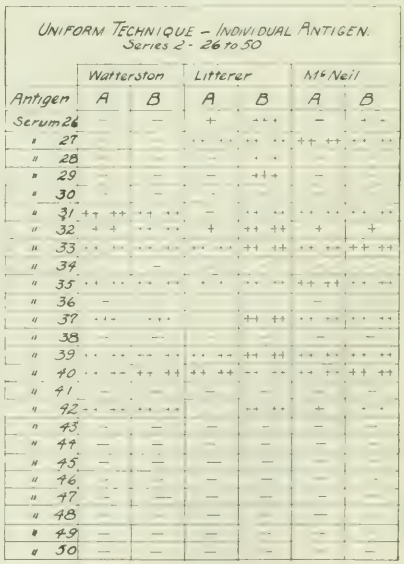
from positive to negative or from negative to positive without an underlying cause, in a great many instances a given serum will at one time react strongly positive while at another time the reaction will not be so intense. In reaching a conclusion as to the degree of fixation, it would be best to make an examination every third day until three tests are made and reach a conclusion from the whole, just as we count a great many more cells than necessary in making a differential blood count or in estimating the number of leucocytes in a patient's blood. We may be perfectly satisfied after the first count that a leucocytosis exists, but if a count is made immediately afterward by the same or another investigator, a variation will be found. The result is estimated from an average taken from the whole. The same conditions should exist with the Wassermann reaction, for sera that are persistently positive will vary somewhat.

Series two shows considerable improvement over series one. All the members with the exception of Dr. Watterston were using a technique with which they were unfamiliar. We mention this, for we feel that it had some bearing upon the result. It must also be remembered that in this series each worker was using a different antigen.

Contradictory findings were noted in seven sera, and, as there were fifty sera in the series, our reports were contradictory in 14 % of all cases. This is a reduction of 12 % in contradictory findings. The reduction is probably due to the fact that the members of the committee were using a uniform technique. A variation in results of 18 % occurred in this series, but as explained in an earlier part of this paper, the results will undoubtedly vary as to intensity at all times unless several examinations are made and an average taken from the whole.

We are, unfortunately, due to lack of time, able to report but a few sera in series three. Positives and negatives, however, agree in every instance in these few cases examined. It is impossible to draw any conclusions from this small series.

The members of this committee attribute the great variation in the results



obtained with the Wassermann reaction to four factors:

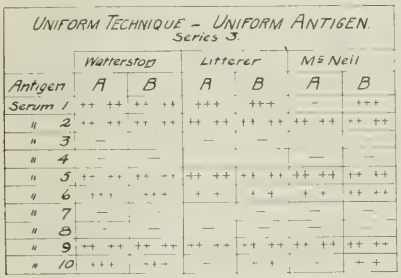
First, wide variation in the technique and the reagents employed.

Secondly, failure to standardize all reagents before each test.

Thirdly, lack of controls of patient's serum and antigen in each and every test.

Fourthly, irregularities in the character and preparation of the antigens employed.

In other papers read by the Chairman of this committee, attention was called to the irregularities in technique, lack of controls and failure to standardize reagents, but the members of this committee have instructed him to call particular attention to the fact that there is no anti-



gen which can conscientiously be called a standard antigen. Every antigen in use at the present time consists of a mixture of various substances which may or may not have antigenic power, and this can not be determined previous to a titration, even though said antigen is prepared in the same manner as other antigens which manifest antigenic powers. Furthermore, this antigenic power may manifest itself in a given antigen with a dozen or more positive sera and then fail absolutely with one serum which is consistently positive with other antigens.

Two of the most consistent antigens were used by the members of this committee in an effort to obtain uniform results when used in conjunction with a uniform technique. These antigens were designated as "Antigen-A," which consisted of the acetone-insoluble lipoid of Noguchi, and "Antigen-B," the cholesterin-fortified made from fresh human heart.

These antigens will be referred to by Dr. Litterer, but I wish to say again before leaving this subject that until there is a standard antigen the results will necessarily vary to a certain extent in the Wassermann test. We can overcome the tendency of the technicians to individualize their technique, but we can not at the present time present an antigen to these men which will act consistently at all times and with all sera.

In concluding this report we wish to say, first, that a uniform technique and an antigen derived from a common source will reduce greatly the number of contradictory reports in the Wassermann reaction; secondly, unless several examinations are made of the serum of the same individual at intervals and a conclusion be drawn from the whole as to the degree of "positiveness" the results will vary somewhat, for the intensity of the reaction seems to vary over a period of time; and thirdly, a perfect result depends upon the discovery of a perfect antigen.

WILLIAM LITTERER, M.D.,
H. L. MCNEIL, M.D.,
LOYD THOMPSON, M.D.,
CHAS. WATTERSTON, M.D.,
Chairman.

DISCUSSION

Dr. William Litterer, Nashville, Tenn.—It is to be noticed by the charts that our greatest discrepancy is the result of using different reagents and different technique. We are thoroughly convinced that our reagents must be standardized, especially the antigens. We are not ready as yet to insist upon a standard technique, but simply advise that some recognized technic be used. Our results are better by using standard technique and standard reagents. It will be necessary that we continue our investigations before we can decide definitely concerning the advisability of adopting a standard technique. Certainly a standard technique, using standard reagents would be the ideal one. The greatest error lies in the antigens. One antigen may combine with a syphilitic serum while it may fail with a different leutic serum. A good antigen should be tried out on many positive serums to test its antigenic powers. A standard antigen is imperative. I should think that some biologic house could manufacture a standard antigen on a large scale and sell it very reasonably. We favor using several antigens. In our series we have used two, viz: the acetone insoluble and cholesterin fortified. We are running in the Vanderbilt Laboratory parallel tests using different systems, and using the same antigens. As a result of our work we believe that the system

is not really in fault. It is the antigen in most instances. Out of over 400 examinations made by different techniques using identical reagents, there was a marked discrepancy of about four, making an error of 1%. This error might have been due to the individual making the test. No human being is always infallible, especially in performing such a tedious technique as the Wassermann test. Recognizing the fact that no technician is infallible, we strongly urge that another test be made, particularly if said reaction does not coincide with the clinical diagnosis. Even a third or fourth test is advised in especially doubtful cases.

Concerning the reading of the Wassermann test, there is an individual error that will account for many so-called discrepancies in the test. Ordinarily the test is read one, two, three or four plus, depending upon the absence of hemolysis. We found that no two laboratory workers would read the tests identically. The error would be usually a difference of one plus, sometimes two plus and even three plus was recorded by one individual. My assistants and I have read over four hundred Wassermanns independently and find this error just mentioned existing. This discrepancy could be obviated by using a standard color scale and matching them similar to a hemoglobinometer scale.

Dr. H. L. McNeil, Galveston, Tex.—I think Dr. Watterston and Dr. Litterer have said it all. However, I will say that at the University of Texas we have used the Noguchi method, the one system as a reagent standard for our tests, and we have welcomed this opportunity of comparing these tests with competent men elsewhere, and the results have been interesting and have been pretty much what we expected from this work. We all agree that the antigen is one of the chief factors in variation. The various antigens made by different individuals, coming from different sources, have a vast influence upon the variations in the Wassermann reaction as done by different observers. From our work we have demonstrated to our own satisfaction that not only the antigen but also the system itself, that is, the human system, and the sheep system, using the same antigen will give a certain number of variations. We have been particularly interested in several of our cases which we have been able to follow which showed such variations. One case in particular was one of syphilis treated late and the man had undoubtedly tabes. This case, by our technique, on repeated examinations was persistently negative. However, we noted the variation as obtained by the two other members of the committee, namely, strong positives. Four pluses were studied with our technique again and we obtained the same reactions. Then we tried the sheep system which we used as a control and it showed exactly the same findings that Dr. Litterer and Dr. Watterston obtained, demonstrating there was a difference in the hemolytic system rather than in the antigen which caused this particular variation, so that the antigen factor is not an unimportant one, because in all of this series that has been the only case. About one out of a hundred shows such a variation from that particular source. It is an important source of error. The explanation for such variations in the various systems is undoubtedly the fact that the human being possesses so-called hemolysins for various kinds of blood. The same applies to the sheep system. The human being may have so-called natural sheep hemolysis, giving inactive Wassermann by the sheep system and a positive by the human system, regardless of whether you take the human or sheep factor into the variation. The committee points to the desirability of having a standard, not certainly one we can not enforce, but it points to the fact undoubtedly that a standard should be recommended.

This work has been extremely interesting and instructive to me, particularly the privilege of working with these men on such a new subject which had not been attempted officially previously.

Dr. Loyd Thompson, Hot Springs, Ark.—The work done by this committee is intensely interesting, and as far as they have gone, the work has been done exceedingly well. A point I want to emphasize is that the Wassermann test can not be taken as the only symptom of syphilis; it must be considered as one symptom of syphilis, and no matter who makes the test, if it does not correspond with the clinical findings, it should be done over.

In regard to a standard antigen, I think that is most desirable, but I do not see how it is going to be possible to have an antigen made in a central laboratory and be distributed to different workers over the country at a charge that will correspond at all to what they can make it for themselves. If you buy antigen from any of the biologic houses you pay a dollar a c. c. for it. For a dollar you can make two or three hundred c. c. of antigen, and if a standard method for making it is adopted, it should be made by each individual worker.

Another point which should be emphasized is the fact that the clinician should have a working knowledge of the Wassermann test himself. He should not leave it all to the laboratory man, because if he does not have a working knowledge of the Wassermann test he is more or less handicapped. I do not mean that he should be able to perform the test, because a great many clinicians can not do that; but, at any rate, he should understand the principles.

Dr. M. L. Graves, Galveston, Tex.—Inasmuch as this committee report, according to their own statement, is incomplete, and has required a great deal of time and very laborious work, it seems to me desirable that the committee should be continued until the work is complete. Therefore, I move that we express our appreciation of this work and that the committee be continued for another year.

Seconded and carried.

AUTHORS' ABSTRACTS

Medicine

Paratyphoid Infections. Jay D. Whitman, Washington, D. C., The Military Surgeon, November, 1916, p. 491.

Paratyphoid infections have been frequently encountered in the present European war. It is believed to be one of the principal causes of "trench diarrhea." Infection occurs nearly always through fecal contamination of food or drink. Carriers are common.

Two clinical types of the disease may be described, namely, the diarrheal and the bacteremic. The former is clinically a simple catarrhal gastro-enteritis.

The organism is found in the stool. A recent outbreak due to the "B" organism was observed by the writer in a community of 137 men, all of whom had recently been vaccinated against typhoid fever. Fifty-three were suddenly taken ill with moderate fever, diarrhea, abdominal pain, vomiting and headache.

The illness was of an average duration of three to four days. The "B" organism was found in the stools of nine out of twelve cases examined. Agglutinations were also positive. The method of infection could not be determined, but was probably due to contaminated food.

The second type of the disease clinically resembles a mild case of typhoid fever and undoubtedly the majority of cases are so diagnosed. Several cases of pericarditis, myocarditis and endocarditis have been described. Paratyphoid "A" is likely to produce symptoms resembling those of enteric fever, while the "B" organism frequently causes a condition of septicemia with a tendency to complications in the bones, glands and heart at times. In preventing paratyphoid infections, the anti-typhoid vaccine alone does not seem sufficient. Paratyphoid organisms should be added to make the vaccine potent.

Experimental Endocarditis: Its Production with Streptococcus Viridans of Low Virulence. H. K. Detweiler and W. L. Robinson, Toronto, Ont., the Journal of the A. M. A., December, 1916, p. 1653.

Experiments have been carried on with a view to determining the pathogenicity and virulence of the strains of streptococcus viridans isolated from the blood in cases of endocarditis less severe than the type commonly called subacute bacterial endocarditis, and in many cases milder even than those commonly recognized as simple endocarditis. These organisms produced in the rabbit with unexpected regularity, any degree of endocarditis from hemorrhage into the endocardium or muscle, to enormous vegetations on valves and mural endocardium. The degree seemed to depend upon the length of time the rabbit was allowed to live after inoculation. All inoculations were intravenous, and large doses were required to produce any effect.

In some instances, lesions were found in other organs and tissues, but there was no doubt as to the preference of the organisms for the heart, both endocardium and myocardium.

Following this work, cultures of streptococcus viridans were obtained from the tonsils and teeth of normal mouths. That very similar results were obtained appears significant and seems to show that the ordinary saprophytic strains are closely allied to, and no doubt through lesions in tonsils or teeth, become the organisms we find in the blood stream.

CONCLUSIONS

1. The streptococcus viridans isolated from the blood in cases of chronic infectious endocarditis is of very low virulence, probably lower than any hitherto reported as being recovered from a similar source.

2. These streptococci are capable of producing lesions in animals identical with those found in the patients from whose blood the organisms were obtained.

3. The strains of streptococcus viridans isolated from the mouth of normal individuals are similar to those isolated from the blood of patients suffering from chronic endocarditis and are equally capable of producing heart lesions in the rabbit.

The Worth of An Early X-Ray Examination In Gastric Cancer. George M. Niles, Atlanta, Ga., Medical Record, December, 1916, p. 1025.

The author claims that the Roentgen ray, as a diagnostic aid in suspected or non-suspected cases of gastric cancer has won a recognized rank. He mentions some of the newer diagnostic processes, as the glycyltryptophan test, the phosphotungstic reaction of Wolff, the hemolysis test, and the modified Abderhalden reaction, but regrets that all of these have been weighed and found wanting in some particular. Two hapless conclusions are forced upon us: first, that a reasonably early diagnosis of gastric cancer from clinical data alone is impracticable; second, that when a clinical diagnosis of such can be readily made, the patient may well set his earthly affairs in order.

Apart from pyloric obstruction, the diagnosis depends upon irregularities in contour caused by the inroads of the growth. In advanced cases the major part of the stomach cavity may be obliterated, showing an irregular shadow possessing no likeness to a normal gastric contour. Adhesions in the vicinity of the stomach, pylorus or duodenum may cause inroads difficult to differentiate from neoplastic growths; and such problems can only be intelligently solved by combined palpation under the screen and a liberal number of Roentgenograms.

In conclusion, the author asserts that when any individual in middle life rather suddenly develops indigestion, and when this indigestion cannot be satisfactorily explained by abnormalities of the circulatory system, the kidneys, the blood and blood-forming organs, or the central nervous system, a careful Roentgenologic examination is emphatically indicated.

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TROPICAL DISEASES AND PUBLIC HEALTH

THE EVOLUTION UNDER WAY IN PUBLIC HEALTH ACTIVITIES*

By John A. Ferrell, M.D.,
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Intelligent procedure in the control of any disease must be based upon accurate knowledge of the disease in all of its aspects. Health agencies are recognizing this more and more, with the result that capable men are being stimulated to carry on investigative and experimental work. Medical schools are maintaining research bureaus, the United States Public Health Service is increasing the number of men engaged in investigative fields, and many public and private agencies have staffs at work with a multitude of experiments which it is hoped may point the way to more effective and more general control of disease. In one instance a force is studying infantile paralysis, in other instances malaria, pellagra, syphilis, cancer, yaws, and so forth, throughout the list of diseases. Experiments with vaccines, antitoxins, and drugs are being made and are no less important than the study of the germs or the methods of dealing effectively with persons who harbor them. The bacteriologist is looking for new pathogenic organisms and is seeking to simplify methods for the detection of those already known; the epidemiologist is making excursions afield to discover the source of epidemics, while the administrator is experimenting with working programs in the hope of finding a plan that will result in the control of a given disease on the most economic basis. All will contribute to the yield in tangible results. One of the most hopeful signs of the times is that, instead of reaching conclusions on insufficient data, our scientists and our administrators are withholding public expressions of their views until they have confirmed them by adequate investigation.

It is in this way that public health work is developing into a definite science. Procedure based upon accurate, scientific knowledge is rapidly replacing the blind, ineffective effort of past years. A reasonably clear line of demarkation has arisen to separate our tangible knowledge from the intangible; and as this knowledge has grown in breadth and become more definite, it has become more and more necessary that men wishing to engage in public health work should undergo special preliminary training. All of these developments are being witnessed by the people, whose confidence and co-operation are being rapidly won.

Fortunately, at the very inception of the new movement in public health work, striking demonstrations in the control of disease were made in Cuba, Panama, and Brazil, as well as in other countries. As a result, health officers in general, some of whom were then at the head of embryonic health departments, were provided with concrete evidence of the possibility of controlling disease. This evidence they used effectively in their educational propaganda, and the people in many sections, were brought with remarkable rapidity to appreciate the value of public health work. Progress in perfecting health organizations, in obtaining effective laws, and in securing largely increased appropriations denotes that the people, as well as the scientists and administrators, have begun to take health work seriously. As an evidence of this growing appreciation on the part of the public may be cited the fact that in eleven Southern states the state health appropriations increased from $216,195 in 1910 to $512,300 in 1915. This is an increase of 136 per cent. North Carolina, with an appropriation of $12,500 in 1910, now has approximately $100,000, an increase in five years of about 700 per cent. Almost all of these states have experienced such growth in the size of the working force that several different divisions have been formed, each having its own administrative head, its own allot-

*Read in Section on Public Health, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

ment of funds, and each being held responsible for results in its special field; while some have as many as twelve full-time medical men connected directly with the state health office, not to mention the large number of non-professional men and women who are utilized effectively in subordinate positions. And as another instance of the rapid development of public health work may be cited the fact that New York State alone now has about twelve hundred persons in the employ of its State Department of Health.

With such increase in the number of persons employed, it was but natural that the work of each person should become more or less specialized and that a demand should arise for trained men to fill administrative positions, to conduct experiments in the laboratory, to become epidemiologists, sanitary engineers, and statisticians. With this demand came the need of schools for training men to follow these careers. Already Harvard, Michigan, Pennslyvania, Tulane, and other medical schools are giving special courses for health officers, and Johns Hopkins is expected to begin its training-school next fall. With growing stability in health organization, increased appropriations, and enlarged staffs, the field will make a strong appeal to young men who are seeking careers, and the training-schools may be expected to flourish. Unfortunately, however, in many cases the salaries being paid do not warrant a full course in one of the new schools. As an alternative plan, the practice of having new employees serve an apprenticeship under persons older in the service who have exhibited marked proficiency has been found a valuable method of training. It will doubtless be followed in connection with the school courses as a means of providing practical training for the student of health work, in much the same manner as the hospital serves to provide practical training for the medical student.

As the work becomes more and more specialized, each of the specialists gains added knowledge appropriate to his particular field and makes advances in applying this knowledge, so that when the results of all of the specialists, each working in his own line, are brought together and properly correlated, it naturally follows that the results accomplished are shown to have been much more intensive than would otherwise have been possible. Formerly, public health work was confined largely to lectures, the printed page, pamphlets, and text-books, with evidence here and there of public health measures being enforced by law; but although by these means a wide audience was reached and large numbers of people acquainted with the principles of disease prevention, the lesson could not be brought home to them forcibly enough in all cases for the measures to be applied. More lately, coincident with the intensification of efforts naturally resulting from increased specialization along all lines, working methods have been developed which do not depend solely upon the printed page, lectures, and educational work of this kind, but aim to secure a response from the people through definite progress in the control of disease within limited areas.

While the method of conducting the work has been intensified, the range of territory in which the work is carried on has been growing more restricted, until very close concentration upon a problem within a small area has resulted in a high standard of efficiency being reached. It is probable, however, that the work as finally developed will fall somewhere between this type, which aims at an efficiency of say 80 per cent. in the control of a given disease, and work such as, for instance, the hookworm dispensary work formerly conducted in the Southern states.

In the organization of adequate health departments, properly correlated for nation, state, county, and municipality, practically all states hold the idea that the most satisfactory initial step consists in the development of a satisfactory frame-work for the central health department of the state. Beyond this step there is some difference of opinion. One group of health officers holds that the next step should be the grouping of counties into districts and the establishment of district health officers, and that these in turn should seek to establish county and town health officers, who should gather about themselves the necessary force to carry on simultaneously and effectively a wide range of activities.

Others object to this program because they think the state will not provide funds

for the erection of so large a framework of new officers without having concrete evidence, in terms they can understand, that what may be accomplished in the end is not mere speculation. Moreover, it is feared that the creation of an office before the accomplishment of results and the development of public opinion warrant it will serve merely to cheapen the office, make it a toy of politicians, and frequently permit the election of men without vision, training, or other qualifications essential for a full measure of success. They believe that after the central framework is reasonably well established, further development will be more rapid if in a given task, —the control of malaria, for example—an effective working force, composed of directors and staffs especially trained and selected for their efficiency, is organized to devote itself in a given area to obtaining measurable progress on a cost basis within the economic reach of the people.

It will be recalled that the national and state departments of agriculture developed to a certain point from above downward. Stagnation was then evidenced in their work until a change in policy caused them to begin at the bottom and work upward. When they began to conduct farm demonstration work, corn clubs, tomato clubs, and pig clubs, a remarkable transformation followed, resulting in their organizations being strengthened and their usefulness multiplied.

Similarly, there are those who believe that if one enterprise after another in the field of preventive medicine is organized and effectively conducted in small units of territory, more or less as experiments at first, confidence in the work and in health officers will be strengthened and the purse-strings loosened. In a given county, for example, after a few successful demonstrations with different problems, it is believed the county would follow business principles and consider the wisdom of consolidating the separate working forces into one organization in a way to increase the efficiency of each but at the same time to reduce to a minimum the overhead charges. Work of this kind would make a strong appeal to the tax-payers because it would be conducted under civil conditions in home territory, and the figures involved in results yielded and in cost would be simple and convincing. Once the people have been acquainted with thorough work such as this, they may be depended upon to provide the funds necessary for financing it; while if the state has thus guided and fostered the demonstrations in public health work, it may be expected that it will continue to guide the activities of the county departments of health which will be organized as a result of the demonstrations. It may be that the most effective plan for the development of adequate health organizations in the smallest governmental units will come partly from above downward and partly from below upward. Which plan would yield most speedy results remains to be seen. The cause is so impelling, however, that either method of procedure should succeed in the end.

Those engaged in health work should be patient with the point of view held by others and should realize that all are engaged in a common cause, starting for the same goal, and finding it necessary in many cases to blaze trails. In the beginning the paths may seem to diverge widely, but those persevering health officers who proceed intelligently, profiting as far as practicable by the experience of others, will find as the work goes on that their paths are converging with the paths of others, so that, regardless of the direction pursued in the beginning, the field as a whole will be covered and the goal that all set out for will be reached.

DISCUSSION

Dr. Oscar Dowling, Shreveport, La.—I am in thorough accord with the policy outlined by Doctor Ferrell. The sooner we can succeed in having whole time health officers the sooner will we get the results we are working for. Now as you know, the average physician must depend on his practice for a living; often he isn't disposed to enforce regulations,—isn't enthusiastic, naturally, about anything that will interfere with his patronage. This means on the part of some, no co-operation in efforts for improved sanitation, sometimes not any in other lines. I know of instances where doctors will report cases of infectious diseases, and invariably close by saying either verbally or in writing, "whatever you do don't tell them that I told you." One can go into communities to advocate various forms of improvements and if the physician finds his patrons don't approve of the idea there will be no support of the movement in that neighborhood. How long will it be before we can secure all-time health officers properly compensated for their services, with funds necessary

for office help, referred to by Doctor Ferrell? Not until there is a public demand for efficient service. We are moving slowly, however, in the South, but we are making progress and I hope the time is not far distant when we will be provided with appropriations sufficient to make effective both state and local health departments.

Dr. Roy K. Flannagan, Assistant Commissioner of Health of Virginia, Richmond, Va.—The idea that Doctor Ferrell advanced in the course of his remarks about the necessity for demonstrating the value of the work of public health departments is of tremendous importance. Public health departments everywhere have developed just as their value has been shown to the public by the public health officer. The state departments of health have to depend upon doctors who get no money, in many instances, for their work, and those that are paid, are paid too little for what they do.

Their work along public health lines therefore has not for the most part been very constructive. I would like to cite you an experience of how an underpaid officer in one of the towns of the South took his job seriously and the result of it. He was kicked into the office over night because of a squabble in the town council over a matter of quarantine applied by his predecessor. The salary was little or nothing, but by actually working and working pretty hard over a period of about two years, he did make things go. He started a publicity campaign, and taking up one thing at a time (it was impossible to do more because he had to make his living practicing medicine) he cleaned up that town; and then the first time the question of salary came up before the town council, they increased it about thirty per cent. It was a mere pittance even then, but thirty per cent. is a pretty fair increase in a man's pay. In the course of the next six months, the work continuing to grow and the people more and more catching on to the idea, his pay was increased nearly a hundred per cent. That brought it up to just $50 a month, but still, it showed that the idea was growing and that he was being appreciated in some degree. Now it so happened that this doctor's good work attracted attention elsewhere, and so he was removed from that locality and got a very much better job in public health work elsewhere, and his successor came into the office at $100.00 a month. There was no effort on the part of the health officer to increase his salary other than to do the job that was before him. I commend this experience to you fellows who are getting practically nothing, certainly an inadequate compensation for what you do. If you will just show the people that you know your job and are in earnest and can produce results, something is going to come out of it, and I believe something will be substantial.

Dr. J. Howell Way, Waynesville, N. C.—I have been very much interested in the papers and the discussions this afternoon, particularly the paper of Doctor Ferrell, dealing as it did, not so much with intimate details but with proximate or basic principles of this work. I remarked to my friend with whom I was sitting that this section is a much younger body than the men in attendance on the section on Practice of Medicine, but I said that's perfectly natural, because the practice of medicine is as old as the days of Adam, and the practice of public health is a fairly recent production. Public health work is, as I see it, just beginning; it has just been born; and its faint initial cry echoes over the world. I won't say that it has been dressed, because I dare not, because before I get back home some public health worker will have fashioned a new theory of public health on some particular line and say that the particular frock that he had on down at Atlanta isn't the right thing for him to wear, and he must put this on. There is the danger of being too positive, too definite about many of the details of public health work. It is new. Now, there are some things that we know we can stress, those we can take our stand on,—certain principles, and stand there, but a great deal of our work is yet in the evolutionary process, it is in the formative stage.

Take my own State of North Carolina, with an area of fifty-two thousand square miles and a population of two and a quarter million, divided into a hundred counties, with an average of five hundred square miles per county, and an average of twenty-two thousand population for every county. We have now about one-sixth,—one county out of every six has a whole-time health officer, on, I may say, fair salaries in the main—and I believe in doctors being paid (I never made any reputation in my life as a low charger, as our Secretary there knows)—these men are fairly well paid for their work, for their experience, for their capacity. They are paid on the average as much as the average good doctor in the counties where they are working is earning. We often hear it said that we need more whole-time health officers. Yes, we do, but, gentlemen, a man can get his mind working on a hat or a fancy vest and a pair of striped breeches until he thinks that's about the only thing that it will take to make his dressed. That's not so. In North Carolina, the men charged with the executive administration of public health work have privately come to the conclusion that we have there just about as many whole-time county health officers as we want now. Not as we want later, but as we want now; for the reason that this work is new, it is yet in the evolutionary stage, so many problems are yet to be worked out, worked out individually, worked out collectively, worked out by the men in the field with the friendly, cordial assistance of the men in the executive offices.

I think we are making great progress, we are making splendid progress. We are going forward in North Carolina, as we are going forward in the whole South. In our state, six years ago we had about $12,000 from the Legislature for our health work. Now we get $100,000.00 Four years ago we had our different departments and the men in them more or less coquetting and flirting with the legislature and the members of it as to how much money they were to get for their departments. Two years ago, as the director of our laboratory of hygiene sitting before me will recall, we got all of those men together at a session of the State Board,—the head of the Bureau of Vital Statistics, Laboratory of Hygiene, Tuberculosis Sanitarium,—at the executive offices in Raleigh and had each one of them to make an average of just what he needed and just what he wanted money to do with in the next two years, and then we put that before our Board

of Health, and the Board of Health said, "well, it's all good, we'll go to the Legislature and ask for all that money that you men want," and we got it. And, gentlemen, in my state, we have quit saying a word about the indisposition of the Legislature and the reluctance of the powers that be to furnish money, because, I'll tell you, gentlemen, in North Carolina as fast as we show the people of my state that we can use that money for helpful purposes, we get it, and I believe, sir, that is true, and that's growing more and more true, of every state in the South. But seriously here, gentlemen, I believe the time has come for us to shut our mouths about the unwillingness of the people to put up the money. The people will put up the money just as fast as we show them that we are giving them a hundred per cent. on the dollar for what they give us.

Dr. A. T. McCormack, Bowling Green, Ky.—I wish very much I could bring you a solution of all the problems that have been raised here this afternoon. While I agree quite fully with every statement I have heard that is material, whether by the county health officers or by Dr. Ferrell, on the principles involved, there are some matters of detail about which my experience has forced some very clear ideas upon me. I especially agree with Dr. Way, that our legislatures are giving us all the money we ought to have, just as I feel that every doctor makes as much money as he is worth. There are not many under-paid doctors. A lot of them have very small incomes but most of this class are not worth much. Nearly every man makes as much as he is worth, whether he is a doctor, selling silk or cotton or what-not. In my state, our doctors have felt that health work was largely a patriotic duty, and most of them have received but little compensation for it. However, this voluntary, part-time, persuasive work has laid the basis and created the demand for all-time health officers who will be paid in proportion as they deliver the goods.

I entirely disagree with Dr. Way in his desire for a few health officers in North Carolina. I would be glad to accept the responsibility for one hundred and twenty all-time health officers in Kentucky, by tomorrow. I would rather have Dr. Abercrombie, and the practical men of whom he is a type, help me solve the health problems of Kentucky than to have all the faculties of Johns Hopkins, Tulane and the rest of them. I do not believe there is a teacher in a single faculty in the United States, who has not been a county health officer himself, and has not had the problems handed him for solution which are brought to the county health officers each day of their work, who can teach our real health officers who have been trained in the practice of medicine, very much. I do not believe that a man should be a health officer until he has had actual service as a general practitioner of medicine. I do believe, with Dr. Abercrombie, that a post-graduate course, after having become an integral part of the great profession of medicine, after being familiar with the work, I do believe the health officer can get great good from the school of hygiene, provided it is practical.

We have in my town in Kentucky, a normal school created by a great genius, who started out without money; he brought in a lot of students and had but three members of his first faculty and he soon had many more students than teachers, so he took all the students that knew anything and soon had them teaching those who knew less. If the faculties of the average course in hygiene could be developed along such a line, they would be far more successful than if they select their teachers from pure scientists who never saw a city council or board of county commissioners, and who do not understand the importance of the human question in the solution of health problems. The modern doctor, whatever be his specialty, has to be trained, well trained to begin with, and then he has to have enough common sense and enough of that something that we can hardly describe and yet we all know exists, that enables him to secure the confidence of the people. I believe the health officer should continue to do enough of the practice in the county or city's elemosynary institutions to bring him in some personal contact with sick people. I do not believe for a minute that the health officer is meant to take care of well people only. Not yet, and not for a million years! He may in the millenium, but in the present age and for a long time to come, there will be enough sick people to make our most important problem to keep them from spreading their diseased conditions, for him to have to know a great deal not only about disease, but about the thoughts and motives both of those who are sick and their families.

It is difficult to have a successful talk with sick people or their well relatives, without having down in you somewhere that feeling that only comes to the conscientious physician; and, in a general way, this is the reason I believe a man trained as a general practitioner just as I believe a man trained as a general practitioner makes the best surgeon, or the best anesthetist, or the best specialist in diseases of the eye—yes, I believe such a man trained in the general practice makes the best health officer, the best superintendent of an asylum or the best anything else that is to come in contact with or prevent sickness, disabiliy, ineffectiveness or disease.

Dr. Mullins has come to us in Kentucky, from the Public Health Service, realizing that he has a definite problem to solve and he has begun doing his job thoroughly, in fact, he has done it so effectively and so well that every health officer, every public official, yes, every citizen that has known anything of him and his work, is anxious that that sort of thing be done for the afflicted of their communities not only in the cure and prevention of trachoma, but regardless of the particular afflictions from which they suffer. The state departments, the national departments, those great voluntary endowed agencies that are training men and solving particular problems, each of these things and all of them create the desire, the demand for the all-time health officer, and the thing for us to do, is to keep before our eyes and before our people all the time the effectively worked health department, and when we ask for the organization, as Dr. Ferrell has so well said, when we ask for legislation for the all time health officer, let us not simply ask that the office of all-time health officer be created, but that a bill permitting counties to have health departments un-

der the supervision and control of an all-time health officer shall be passed, and, at the same time, authorize him to have assistants as rapidly as ways and means and the public demand can be created. This is a most important element. We have thirty-eight all-time health nurses in thirty-eight different counties in Kentucky, and they are creating a tremendous demand for the all-time health officer, for they are almost powerless without him and each of our all-time health officers, in turn, wants a public health nurse and other assistants, and it is far easier to pass general legislation than specific legislation. It is easier to get a number of assistants than one, if you fix that one's salary. We find it a lot easier to get a department created for the State Board of Health than to get an individual officer with a fixed salary.

Legislators have an uncanny sort of wisdom and if we go before them with half-baked plans that seem to savor more of personal aggrandizement than public welfare, they see through our flimsy schemes so quickly that, in our superior wisdom, we are apt to condemn all legislative bodies as unthinking. On the other hand, take before a legislative body or committee a complete plan, show them that a given department can and will do good for the great common people, of whom they are a part, and whom they are elected to represent, and it is my experience that you gain their support just in proportion as your plan is worth while. Personally, I believe all these things are going to work out, the demand coming at the same time up from the people and down from the various departments. I believe we are going to have a National Department of Health, of which the present Public Health Service will be the executive right arm, and that it is going to have a sort of co-operative supervision of state health departments, and that these, in turn, will supervise county and city health departments with competent, civil service protected all-time health officers and the necessary assistants to solve the health problems that confront us in all parts of our Southland. Until that day, we will make progress but slowly, but in proportion as each of us acts well his part in laying the foundation for the health department of the future which will banish preventable diseases, make medicine more honorable and the people of our section more effective, longer lived and happier.

Dr. Wm. S. Keister, Roanoke, Va.—I hesitate to discuss a subject like this without being more experienced than I am, but I believe from certain facts during these discussions and these magnificent papers, that I have been able to read the signs of the times. I believe the sign of the times today is popularizing public health. It is a little unpopular at the present time, but the trend of public health activity is to make preventative medicine the popular thing. I believe, too, the public wants preventative medicine. I believe they are anxious for it, I know health officers are anxious to give it to them. Why don't they get it? There is a big gap between us yet. That gap can only be bridged by education. Now, we must cover up that gap in some way. We have been content during the years gone by to let the charlatans and quacks and patent medicine fakirs and every other "schism" and "ism" advertise its remedies and fool the public and we have sat idly by and done nothing, and I say we have got to do about. If it is necessary to have a torch-light procession or brass band to play every time you build a sanitary privy, we had better do it. The people want spectacular things, that's the public idea, that's the reason moving picture shows are overflowed today, and health officials have to take to the spectacular if we want to gain the public to our side. I believe there is two sides to educating the public, one is the education of the adult and the other the child.

The greatest hope, of course, is in the school, educating the child, and sometimes I think it is a pity to ever have public gatherings of school children or teachers anywhere unless there is a health teacher there to give them a talk, —not a long drawn out affair that will tire everybody out, but a short, snappy talk with demonstrations, something that will catch the eye,—with pictures. Then there are a lot of old hay-seeds we never will convert, especially among the white people. But the Negro is a child, he wants to be led, and I think one of the most hopeful things in public health work is trying to lead the Negro, and, of course, the least hopeful is the adult white man, but we must try to get him, too. If we can entertain as we instruct then we can lead them, but we have got to combine entertainment with instruction.

Dr. L. B. McBrayer, Sanatorium, N. C.—I want to express my appreciation of Dr. Ferrell's paper. He suggested that he prepared it this morning, and if he told the truth about it,—and I have no reason in the world to doubt what he says, because he is too shrewd to ever get caught in an untruth, if he ever got consent of his conscience to tell one—but if he did prepare it this morning, he did so for the reason that he wanted to feel the pulse and find out what the folks here were saying, so that he could fit his paper into the things we have been talking about. I don't think if he had studied a hundred years he could have prepared a better paper for our information than the one he presented to us this afternoon; and personally, I desire to express my appreciation and thanks to him.

I intended to say just what Dr. McCormack has said, but I am mighty glad he said it, because he said it so much better than I could, and I want to add this one thing: I agree with Dr. McCormack, and I don't believe that the degree of Doctor of Public Health is worth much. I thought on one occasion I wanted my son to get that on the side while he was graduating at the University of Pennsylvania, and later on I thought it was hardly worth while because, as Doctor McCormack so well said, they don't know how to teach a health officer, they don't know what a health officer is, and they are not going to, either, until they come down and find out. Now, the thing we need is the real work under a man like Doctor Abercrombie and Doctor Sevier and a good many others whom I could mention. I will tell you for the fear that you don't know, that Doctor Rankin, who isn't present at this session, Secretary of the State Board of Health in North Carolina, has had in mind for some time the organization of a school for health officers, and his idea was that they should pass through every department of the work of the State Board of Health;

that they should go into his office for a certain number of weeks and find out how he was doing things, that they should go over to the Bureau of Vital Statistics and then they should go down to Doctor Shore's State Laboratory of Hygiene and spend a certain length of time and then to Doctor Cooper's Bureau of Rural Sanitation and then to the State Sanitarium for the treatment of tuberculosis until they were familiar with all those things, and after that they should go out with our whole-time county health officers and spend a period of several months, perhaps six, and the whole course to cover perhaps not less than a year. Now, that's a feasible thing, that's a workable thing, because during that time they would be receiving a salary, they would be receiving, say $50.00 per month, and perhaps they would be doing for the State Board of Health, through its various activities, an amount equal to $100.00 a month, but they would be paying these men $50.00 a month in instruction. I believe that that particular kind of course is needed worse today than it has ever been, and that it must be supplied in the near future.

Dr. Ferrell (closing):—The opinions that have been expressed appear to me more or less in harmony. We are all aiming at the same end. Our working methods as paths will inevitably and fortunately diverge. In each instance where the impracticable features are eliminated and the practicable ones strengthened we may confidently expect the paths finally to draw together again so that these courses will all fall into one broad road. We need not therefore be alarmed at the views of our colleagues with reference to any particular procedure or working method. If, for example, there be no need for special schools for the training of health officers they will not succeed. If they are needed they will survive. If there is a real need for well 'rounded health organizations for counties, we shall have them and those working from the community up and those working from the state capitol down each in his own way will contribute something toward the final structure. Experience, intelligent observation of all that is being done, and an assimilation and application of what is practicable, will shorten the road to the final goal on which there will certainly be a survival of the fittest.

THE IMPORTANCE OF THE CONTROL OF CHILDHOOD INFECTION IN THE CRUSADE FOR THE ERADICATION OF TUBERCULOSIS*

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The world having at last been awakened to a realization of the great importance of the tuberculosis problem and its bearing upon the welfare of the body politic, we can not today complain of any lack of interest in the subject when all over our land splendid and purposeful efforts are being put forward toward the eradication of this pest. No live and up-to-date society, in its section on public health, could fail to pay some attention to the question of the prevention of the transmission of this disease. Hence I need make no apology for the title of my paper today.

In the study of the means at our disposal for the eradication of tuberculosis, there are two things to be considered: first, the infectible subject; and secondly, the infecting organism. As to the second, very rightly, extreme importance has been placed upon the necessity of effort to destroy the germ by the proper disposal and destruction of the sputum of all consumptives; and it is doubtless true that if we could destroy all such sputum we could justifiably hope to put an end to this disease in a relatively short time.

However, as long as the American public continue to expectorate as promiscuously and enthusiastically as they now do, and as long as we can create no strong public sentiment against the disgusting habit so that spitting will be regarded as nasty, such an aim must remain nothing but the iridescent dream of an optimistic hygienist, and can not become a realized fact. Of course, the impossibility of inculcating proper spitting habits in the general American public is no reason for lessening our efforts properly to care for the sputum of all those whose actions we can control; and efforts in this direction will always have an important and prominent place in preventive medicine. But this subject has been sufficiently treated by many authors and need not be gone further into in this place.

Again, in any study of the infecting organism, we will have to take into consideration the virulence of the germ, which varies greatly. It is usually believed, though I do not think there is any absolute scientific proof of it, that the short, thick, deeply-staining germs, coming from rather acute cases, are more dangerous and the beaded, poorly staining long germs, coming from old chronic

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cases, are less dangerous. While there is plenty of ground here for laboratory experiment, it need not at this time concern us; and I will turn my attention to the more important question of the infection of the infectible subject.

For the purposes of study, infectible subjects can be divided into babies and children up to sixteen years of age, and adults above that age.

Until the last few years it was usually assumed that an adult was as open to infection as any one else, and that the majority of infections which we discovered had occurred during adult life. But in recent years, especially since the work of Von Behring, we are beginning to realize that the usual period of infection is in childhood and that new infections in adult life must be very rare, if the scientific work on childhood infection is correct, and that while the reinfection of a person infected earlier in childhood is possible, it is not likely to be a common occurrence. Were adult human beings as easily infected as many, even among our profession, believe, and were man's natural resistance to adult infection not so good, doubtless the whole world would have been wiped out long ago by this disease. The fact that this has not occurred is the best answer to the absurd and much-overdone fear of infection which we see so often, which causes so much needless suffering, and for which, unfortunately, our own profession is so largely responsible.

The layman and the alarmist doctor assume, though it is a most unwarranted assumption, disproved by ample experimental evidence, that the entry into the body of a single bacillus makes its recipient a consumptive, whereas it has been demonstrated very clearly that successful infection demands the introduction of a large number of sufficiently virulent bacilli into a weakened organism at one time, or the introduction of a smaller number slowly over a long period of time, such as we see in a family where there is a careless consumptive member.

Webb, of Colorado Springs, by using very careful methods, has been able to count and to introduce from one up to five living tubercle bacilli into the human body without producing any infection at all, the resisting power of the body through phagocytosis and otherwise quickly disposing of such small numbers of invaders. Moreover, the implantation of the germ is by no means synonymous with the production of active trouble, the germ tending to lie latent for a shorter or longer period of time, and this latent infection not developing into active disease until the subject of such a successful infection is subjected to depressing influences, such as sickness, poverty, trauma, overwork, worry, grief, dissipation, pregnancy or certain sicknesses, such as typhoid, measles, or pertussis, which lower man's naturally great resisting power, and give the germ a chance to develop.

In view of these facts, which have ample experimental evidence behind them, how absurd are the fears expressed by laymen, and too often by physicians, of a possible infection from temporary and even outdoor association with a consumptive, as though the germ were some motile organism which would jump from host to victim, or could be transmitted like smallpox or measles by mere propinquity. In view of the prevalence of such ideas, it can not, then, be too often stressed that *infection probably never, and certainly rarely, can occur outdoors*; that while houses become infected, if not properly cleaned and cared for, tuberculosis being eminently a house or indoor disease, streets, and the great outdoors, do not thus become infected, that greatest and best disinfector in the world, the Sun, seeing to it that the germs there deposited are quickly rendered harmless, and that *it usually takes a prolonged exposure indoors, under insanitary conditions*, such as are chiefly seen in our slums or poorer dwellings, *for adult infection to occur.*

Furthermore, I am not at all afraid to state that *the clean consumptive, well instructed and with proper habits, need be, and usually is, of no danger to those who dwell in the house with him, if they are not children or young people.*

Furthermore, when we search for the periods when the infection originally occurred, which doctors are very apt at times to state with great positiveness was due to such and such an exposure, we should remember that the period of incu-

bation of tuberculosis is very long and very varying in different cases; and that the infection lies latent in the body for several months at least, and often for very many years, before it produces any clinical evidences, and hence that to determine the infecting cause is usually difficult or impossible.

Save, then, in our slums, where poverty, starvation, dissipation, vice and the cupidity of landlords produce favoring conditions, adult infection can be regarded as the exception rather than the rule, and *the attention of those occupied in preventing the spread of this disease should,* as far as it is directed to the infectible subject, *be directed to the periods of childhood and early adolescence.* This view, first brought forward by Von Behring, attracted not enough attention until the work of many observers, among whom I would only mention Naegeli, Von Pirquet, and Northrup, of New York, showed how almost universal was the infection of children. That this childhood infection occurs early was shown by Von Pirquet by the use of his cutaneous test, which, as you will recall, showed in the children of the clinics in Vienna 93 % of positive reactions at fourteen years of age. While this per cent. would not hold true of children of smaller towns, or in the country, it is certainly very suggestive.

Furthermore, it has been amply shown that the germ usually lodges at first in the bronchial lymph glands, though whether it reaches these from the tonsils through the cervical lymphatics to these glands, or is carried there from the alveoli by the wandering white cells is not easily determined. Northrup, of New York, showed most effectively by the inoculation of guinea pigs with the emulsified bronchial glands of 125 children dying of ordinary causes, that such a bronchial gland infection in the children of a large city is the rule, 100 % of the pigs having developed tuberculosis.

Again, Naegeli, in Zurich, showed that by careful autopsy some evidence of previous or active tuberculosis could be shown in 100 % of all dead bodies at thirty years of age or over, and in 50 % of those at eighteen years of age.

There have been plenty of other observations along this same line, but these are sufficient for my present purpose, which is to show that infection with tuberculosis occurs usually in the first fourteen years of life, chiefly in the bronchial glands; that it lies latent until favoring influences later in life give it an opportunity of developing, and that while adult reinfection doubtless occurs, it is certainly not the rule, the case that we discover being only a waking up of an infection which has occurred long before. If so, it is safe to state that *the problem of the prevention of infection in tuberculosis, as far as the infectible subject is concerned, resolves itself into a question of protecting our children*; or, if this be impossible, — and this is a very debatable question,—then our task is to so strengthen their constitutions that such unavoidable infections as they acquire shall be rendered harmless, and even beneficial, by producing a certain degree of immunity in the child.

Indeed, it is very probable that where the infection is gradual and continuous, the host slowly acquires a high resisting power to tuberculosis; that an infection occurring in adult life for the first time, as in savages who have never been exposed, is apt to result in an acute and dangerous form of the disease, and that the usually chronic course of the trouble is the result of a partial immunity created by repeated and long-continued introductions of the germ into the body in childhood. In this connection we may recall the well-known fact that scrofulous children seem unusually resistent to pulmonary tuberculosis.

However, while this is probable, it is not susceptible at present of scientific proof, and certainly would not excuse us for any carelessness in allowing the exposure of children to adult consumptives; and, therefore, the problem of the protection of the child from infection holds the chief place in the prophylaxis of this disease.

Unquestionably the chief danger to the child is in *the family*, though the habit of many people of kissing every pretty child that they see offers another danger point.

Probably the greatest number of childhood infections occur within the child's own home, from those of its own blood, or from its own nurse. We can

not, and doubtless would not care to, follow with human beings the veterinary practice and take the child from its tuberculous mother at once after birth. In this way cattle breeders have learned to bring up healthy cows from the offspring of tuberculous mothers, whereas the calves left with their tuberculous mothers invariably and soon become infected.

However, it is the physician's duty to see that the babies of tuberculous, or even of merely pale, coughing mothers, be not kept on their mothers' or nurses' beds, or kissed by them, and that their lives, at least 'till twenty-one, be regulated according to the very best hygienic rules.

Our profession has not yet reached the point when it watches the apparently well children of the families for whom it cares, or sees to their proper and symmetrical development; nor is it careful to see that they are built up so that they are less likely to become sick, and should they so become, that they may be strong enough to present a good resistance to disease. But the public before long is going to expect just this sort of care of us, and rightly; and it would not be at all surprising to see the adoption of the Chinese point of view, which demands that the doctor earn his living not by curing the sick, but by keeping the well healthy.

But even when the members of a baby's family are healthy, it is not at all unheard of that they pick out a nurse for the child or a cook or maid for the home who is herself infected with tuberculosis. I believe it to be the duty of doctors carefully to examine nurses and wet-nurses who are chosen for their charges, for tuberculosis as well as for syphilis.

The important evil of uncooked milk as a source of childhood infection need here be only referred to. Despite the fact that milk loses a part of its nutritive value by boiling, the commonness of tuberculosis in cows and the frequent demonstration of bacilli in dairy milk make it important that where we can not be sure of the unimpeachable health of the cows supplying the milk, only boiled milk should be fed to babies or children up to 16, after which the permeability of the bowel wall to the germ lessens.

Judging by the great rise in the tuberculous infection curve occurring in children just about the time they begin to crawl around upon the floor, this period is probably one of the most dangerous for them, and great care must be taken that when they play on the floor, as all children will wish to do, that it be covered by a sheet, for our knowledge of the laws of gravity assures us that the majority of germs will finally collect upon, and in, the carpets and between the floor boards, where children, especially in their tenderer years, love to play, and which they wipe up with their moist little fingers which they so promptly put into their mouths.

He who raises his voice against the delightful, but unhygienic, habit of kissing children on the mouth, or of allowing them to be fondled too closely by parents and relatives, is sure to raise a storm of sentimental protest, but I am glad to note that there is slowly growing a feeling that little children should not be kissed, and when this becomes universal it will do a great deal to lessen childhood infection.

Another common but unhealthy household habit must be given up if opportunity for infection is to be lessened—I refer to the habit of mothers and nurses feeding children with their own spoons or forks, from their own plates, a habit as dirty as it is natural. When taught that the pathogenic bacterial flora of the cleanest mouth contain pneumococci, influenza bacilli, and strepto- and staphylococci, all intelligent mothers, and some of the better class of nurses, will desist. But the harm done in this way among our lower classes must be great.

Necessary as it is to prevent unhygienic habits, in order to prevent the occurrence of infection, it is more important, I believe, to so carefully regulate the child's life and attend to its hygienic and physical education, that its resisting power be kept high, thus rendering harmless those germs whose introduction we are so little able entirely to prevent. Here comes the opportunity for the wide-awake family doctor, who should, at least bi-annually, carefully inspect the noses, throats, pharynxes, ears and tonsils of the children under his care, and be able to detect adenoids or bad tonsils, to note and correct beginning spinal curvatures and thoracic deformities, and who will recognize

that a Harrison's groove, or a funnel, speaks for obstruction to the entry of air in the chest in a child, whose bones have been softened by improper nourishment, and who by an adequate diet, adenectomy, tonsillectomy and properly, purposefully-directed pulmonary, spinal and other gymnastics, can remove the harm before the little soft bones of childhood have set hopelessly into deformed positions which in adult life, by limiting lung motion, give opportunity to the ubiquitous bacillus.

After the child stops crawling upon the floor and walks around, a perilous time comes when he, or she, goes to day school, for the hygiene of our private schools, and of too many of our public schools, is woefully deficient. How often does a healthy, rosy-cheeked child, after he has begun school, come home complaining of headaches due to the long hours and to badly-ventilated, over-crowded, over-heated school rooms. How often do its cheeks become pale and its little back begin to stoop, while its eyes suffer! We should all watch the children of our patients closely at such times, and make it a point to inspect their school rooms and school conditions, and if possible to correct their faults.

Above all, however, we should encourage outdoor schools, the wonderful effect of which upon delicate children many of us have seen. Valuable as education is, no amount of it can pay for ruined constitutions, deformed bodies or acquired infections; and there is no excuse for conditions in our schools today which too often resemble those which must have existed in the Middle Ages. Since we know now that the best education can be acquired with no harm but rather benefit to the pupil's physical health, and since such unhygienic schools are a remedible evil, let our profession take pains to see that all schools in the community give their pupils proper hygienic conditions; or, if the doctor finds that he cannot secure such for the children of a family he cares for, let him see that they be removed from such school, even if they have to be taught at home.

While it is probable that tuberculous infection has usually occurred before boarding-school age comes, the conditions here too often give the depressing factor which enables the earlier acquired infection to break forth. The histories of my women patients have convinced me that there is at least one great advantage in boarding schools for girls, in that the regular hours and system which are so lacking in the bringing up of our girls at home, are here enforced, and I find that most women will weigh their best weight and show their best health during boarding school days. But I have seen too many girls broken down at school, usually in their strenuous last year, by over-ambition, or violent athletics, and too many cases of tuberculosis, usually, unfortunately, of an acute type, originating there, to be able to regard boarding school life as hygienically perfect.

With boys, over-exertion in athletics, over-study at times, and too often dissipation, take their toll; while at times too small, ill-ventilated bedrooms, with too many occupants, or at other times sick roommates, result in not a little tuberculosis' originating here. Every child when it goes to, and returns from, boarding school should be carefully gone over by the family doctor to see that its health is not impaired; and the rule, now becoming so common, that no teacher with tuberculosis, or with a chronic cough, be allowed to teach in any school, should be strictly enforced.

Thus I have briefly outlined the dangers which surround mankind in the early years when a tuberculous infection is usually acquired. I have shown what we should do, not to prevent, for I do not think this certainly desirable, even if it were possible, but how to control this infection, and how by holding the patient's vitality at a high point to increase his resisting power so that the infection, if it has occurred, will lie latent and do the minimum of injury.

In view of modern scientifically determined facts, we must view tuberculosis in a double light. First, as a latent infection or condition, which affects everyone and which is not to be unduly dreaded, which indeed brings with it a certain degree of immunity for its host, and which demands that that host be kept in childhood and later keep himself, at the highest point of physical perfection, so that the germ may get no foothold. Secondly, we may regard it as active infection, or disease, which manifests itself by signs and symptoms

from the very earliest, easily overlooked even by the most expert, to those far advanced, which can be diagnosed by the most careless physician, or even by an intelligent layman.

The doctor's duty then toward tuberculosis is not merely to treat the disease when it makes itself manifest, however early his diagnosis, and however well he may have mastered its treatment, but to keep his eye closely upon the general health of his ostensibly well patients, and especially upon the children of his families, and to see that their hygiene, their methods of living, their surroundings, their studies, etc., are so wisely regulated and so hygienically prescribed, that the infection, which we may safely assume they have acquired by fourteen, will be rendered as harmless and barren of results as it often is.

When we look at tuberculosis in this light we see, what I have often stressed before, that its treatment is primarily a hygienic and a sociological problem, rather than a purely medical one, and that everything which lessens poverty, improves conditions of living, disseminates education and information, cheapens and improves the quality of food, inculcates proper hygienic habits, works to lessen the fitness of the soil for the growth of this germ. As modern science develops, the doctor is becoming more and more a hygienist and a teacher, less and less a treater of active sickness, and the body politic, for lack of the scientific information, turns to him, and can turn with faith and confidence, to show them how to live and how to protect themselves from their own ignorance or folly. What the effect of such hygienic instruction will be upon the pecuniary results of the doctor's calling, I cannot say. But whether we like it or not, this change in the doctor's position is coming, and we must be prepared to accept it. Such sections as there are the ones that will first have to meet these problems, and it seems that it would be appropriate if the motto of the Section on Public Health were "Prevention is better than cure."

DISCUSSION

Dr. W. L. Dunn, Asheville, N. C.—Dr. Minor has covered this very important subject so thoroughly and so completely that in the opening discussion of his paper I feel that it can be little more than a formality, and that the only thing to add is to emphasize still further, if it can be done, the importance of childhood infections, not only as a general problem but in the individual ones.

I sometimes am struck with the fact that the prevalence of tuberculosis infections occurring in so many instances are a commentary upon the efficiency of our present measures of prophylaxis and that it probably doesn't speak very well for our educational propaganda and for the efficiency of what we have done, because, so far as I know, there is nothing yet to show that tuberculosis, the incidence of tuberculous infections in childhood, is less now than it was fifteen years ago.

However, we know this: that we have swung from one extreme to the other; first we have set the world on fire with their fear of infections of tuberculosis; we then pictured every tuberculous individual as a sort of sneering devil that was dangerous to come anywhere near, and then we found we had gotten a lot of trouble and found we were not telling the truth, and then suddenly got the idea that nobody got tuberculosis in adult life; that it was only a childhood infection,—a sort of back swing from one to the other. The people have been very generous to us, however, and we have been able to hold their confidence in spite of this marching up and down the hill, but don't let's go too far with this childhood infection business. It's true, let's emphasize the importance of childhood infection, the great number of people who are infected in childhood, but don't let's be so cock-sure that adult infections don't occur or occur with such great infrequency; I believe we may have occasion to march up the hill a little way again, or down, or whatever way we are going—I don't know whether we are going up or down just now—but I'm a little afraid we may have occasion to do one or the other again; and besides, I think it is going to help us a lot in our prophylaxis measures not to place all the responsibility upon the child. And it's quite possible—I think we all have the impression of tuberculosis as a chronic disease, and to eradicate all childhood infections and to work tuberculosis into an acute disease I think is a danger we can well take the risk of; but I think that the placing of childhood infections is not a very great one.

Now, one more point I want to emphasize. It is a little dangerous one to make, and perhaps will be rather an unpopular one. It is very commonly said that the sanitarium for the tuberculous is the safest place in the world. Now, that's true for adults, but I want to protest that the sanitarium for tuberculosis, open tuberculosis cases, is no place for well children. Now, I want to insist on that. We preach so much about sanitariums' being the safest places in the world; that's all right so far as adults are concerned, but it isn't so far as children are concerned. Every one should be as careful with his children as he can be. We have got to teach people that the shortest road to the child, in the infection of the child, is anything that can possibly go into his mouth; we have got to be very careful about teaching them about the kissing of the hand. I would rather anybody kiss my baby on the mouth than on his hand, because if anybody has got it he's going to get it from his hand into his mouth, and he's going to shove

it down into his mouth just as far as it can go. Now, that's a fact. We teach them to protect their mouths. Well, their hands drop on the arm of a chair, the little chap comes along with that little mouth on that arm of the chair. I have my own little baby, gentlemen, in a sanitarium, and one of the most careful patients I have ever seen did that very thing—she put her hand up to her mouth to cough and dropped her hand to the arm of the chair and my baby came right along and caught that infection. I think these are points well worth remembering. And I want also to say that my patients that I have had,—and I have had lots of them,—have set a very poor example.

Dr. John J. Lloyd, Catawba Sanatorium, Va.—There are a few points Dr. Minor brought out that seem to me so important that I would like to try and stress them again. The first one was about the importance of destroying the bacillus. I saw a case very recently that illustrated that more clearly than anything I have seen in a long time. A year and a half ago I made a diagnosis of incipient tuberculosis in a mother and I advised her to go into the sanatorium. She decided to go and she went back home and the family physician told her she didn't have tuberculosis and she accepted his diagnosis. She had a very definite right apex, she had mild symptoms, not marked symptoms, but she had a cough and she was three pounds above weight—that's what threw the family physician off, I think—but anyhow she continued coughing. Last Christmas her little girl, six years old, developed an acute abdominal condition, vomited severely a week or ten days, then ran a marked temperature; I saw the child a month or two ago—she had a right base that was markedly infiltrated, had a cough. I got a specimen of sputum and it showed positive. The mother was admitted to the sanatorium as a moderately advanced case in May, and with a larynx which showed ulcerations. That brings a concrete example of caring for the mother. If that mother had been properly instructed and watched so that she would have taken care of herself and her bacilli, I don't think that child would have broken down.

I don't believe too much can be said about cleanliness in the matter. Dr. Minor stressed that point, but I want to stress it again,—and you know windows were put in the homes by some people simply for light, and we doctors are in a very large measure responsible for that attitude. I know last night I felt like closing up my windows. But we ought to teach our patients the importance of proper cleanliness and ventilation. We are much more careless in raising our children than in caring for any of our domestic animals,—our horses and our cows. Most of us let our children run until they are exhausted, let them eat anything they want to eat and yet we expect them to go along and raise themselves. I'm not talking about our doctors, specially, but lots of us do that, but I'm talking about the homes in which we practice, and we ought to teach more hygiene in the home. When we are trying to control tuberculosis by catching the bacilli and destroying them, we have to use very specific and plain talk in instructing our patients.

Up in Virginia, we are trying to carry on a campaign of education among the school children and a thing happened not long ago that struck me as being right funny, but teaching us a good lesson. In one of the schools, one of the members of the State Board of Health,—I think it was the Health Commissioner,—gave a talk, and in telling the children the importance of covering the mouth to catch the spray, when coughing or sneezing, as a means of preventing colds, grippes and such things, he said: "If you can't get your handkerchief over your mouth and you have to sneeze or cough, then get your head over and cough out or sneeze on the floor." One little child went home and the mother asked what she had heard in school, and she said: "Doctor told us to lean over and cough and spit on the floor." That's a sample, and we have to be careful to avoid that sort of thing.

Just in closing, I would like to ask Dr. Minor if he believes in the rule of raising children on "sweet sixteen and never been kissed?"

Dr. Minor: It's a very good rule.

Dr. S. M. Woo, Chang Chow, China.—I know of one family that's very large. It has about forty members, and six brothers are all married and they lived together, and the second brother has a wife who contracted tuberculosis and after five years' sickness she died.

Dr. Minor: Had she been cared for?

Dr. Woo: Very poorly, and very poor prophylaxis, too; they were very ignorant. Then about two years after this, this patient is the mother of the second family, as we call it, she had two sons and two daughters, and the oldest son had married. Two years later the daughter-in-law came down with tuberculosis. In the meantime she had no other contact with any other case, because she never left the home and there was no tuberculosis in that home, and then she died after about three months' sickness. Then the second daughter came down with tuberculosis about ten years later, and probably she also got it from the mother, because she didn't associate with outside people at all,—that's the custom, considered, for women to stay at home. Then the youngest daughter, who came to see the mother, lived in the country, and she is now having tuberculosis after fifteen years. Now, from this case, although it is not conclusive, I think it is at least suggestive of a few points. In the first place, both sons are all right. In the second place, it shows that very intimate association is necessary for contraction of the disease, other things being equal, because all the other members of the family all escaped, because these five others didn't associate with the patients so cosely as the daughters and the daughter-in-law; and the two sons are all right, because they didn't associate so much because they go out a good deal. Then, it also is suggestive of the point that Dr. Minor brought out, by reinfection. Evidently these three women got the disease during the illness of the mother, but they didn't develop until two, ten and fifteen years later. It is also suggestive of the fact that resistance plays a very important part, because the two sons are a good deal stronger than the daughters and the daughter-in-law, and also they lived more out of doors; and from this, I think, although it is not at all conclusive, we can see that it does illus-

trate reinfection, intimate association and resistance.

Dr. A. T. McCormack, Bowling Green, Ky.—In the discussion of Dr. Minor's paper—and I don't think I have ever listened to one which gave me more food for thought and consideration, — it brought to my mind an incident I recently saw in Mason County, up in the upper part of Kentucky, that I thought would be of interest to everybody here, and I thought I would tell about it. I was driving with the County School Superintendent of one of the consolidated schools, and in Mason County every school there has a whole-time health officer elected by the pupils in the room. He is elected for a term of a month; he wears a badge with "Health Officer" on it; he has the power of arrest at any time the occasion might arise for any violation of any of the health regulations. The idea was started by Miss Yancey, one of the finest women I ever knew, and I take a great deal of pleasure in telling about it, because it is one of the most practical means of education I have seen, and it is spreading all over Kentucky just like wildfire. As we went up to the school house, just as we went in,—the teacher had no idea we were coming,—an arithmetic class had been going on—and everybody here knows the importance of arithmetic; you know how we were tortured with the thing, solving impossible problems that never could, would or should happen, during all of our early years, while all reasonable ideas we would probably run across were carefully excluded. Well, a lesson in arithmetic had been going on, and there was a wise teacher in that room. The Health Officer had just arrested a boy for the remarkable crime in that town of sneezing without putting a handkerchief or piece of paper over his mouth (great applause), and the teacher suspended the class of arithmetic, summoned a jury of six pupils in the other room who didn't see the thing committed, and the trial was just starting. One pupil was appointed to represent the criminal, another the commonwealth, and the evidence was presented to the jury and the jury arrived at a verdict that the boy was guilty, and he was sentenced to clean the sanitary privy, with which that school was provided, and to put the water in the toilet for three months.

Now, that statement answers a great many of the things that are problems to all of us. That thing done in that county has already a response; the response has come about already,—it is impossible and it is unthinkable that a legislator could go from Mason County that didn't believe in advanced legislation along health lines; he couldn't go to the Legislature and come back to his people and hope to explain to them any dereliction of duty as far as public health was concerned while he was a member of the Legislature and expect to be re-elected, because they have an amount of intelligence in the mass of the public in Mason County, in their homes, that has been brought there by the children, that already makes it impossible that such a man should represent them. They can't help adequately supporting their Board of Health because public sentiment has responded in such a measure in the short time that this system has been in operation; it has already responded in such manner that they have been able largely to increase all their health work and very greatly decrease their sick and death roll. This is a matter of tremendous importance.

Now, Dr. Sloan, in his excellent paper this morning, and Dr. Minor, in a different sort of way, are stressing two points in the management of tuberculosis in the sanatorium or in the home that are of tremendous importance, that is, that the patient must be put in such condition when he has it,—kept in such condition or put in such condition that he again becomes an economic unit in society. I think Dr. Sloan's statement in regard to the management of the sanatorium in such a way as to teach the individual to be a propagandist at the end of his term in the sanatorium is of the greatest importance. The only objection I have to the proposition is that it applies only to the tuberculous. And it seems to me that we should call the tuberculosis sanitariums "schools for the tuberculous" instead of sanitariums, in the sense of the word that they are merely custodians of advanced cases; that they are really schools where people have tuberculosis and therefore are interested in it, and are taught, as pupils in the normal schools are taught to be school teachers, to be health teachers back at home, if they live long enough for that purpose.

I agree very fully with the statement of Dr. Shoulders, and if I had $200,000.00 and only $200,000.00 to use in the prevention of tuberculosis, I would not build a sanitarium first with the money. I believe that the building of sanatoria is a very important part of the campaign, but I believe it will come later on. Where used now, where used at first, because of the limited amount of funds in hand, its chief value, as far as the largest part of the public is concerned, is that it brings to their attention the method and importance of prevention of tuberculosis,—it is the publicity that comes from the sanitarium rather than the work done in the individual case, except insofar as the inmates of the sanitarium are taught to be teachers and to go back home as propagandists for the methods that have been properly taught there, and that, to my mind, is the great good of the sanitarium to the home,—I mean, to the public; but the sanitarium, the value of the sanitarium, is multiplied more by just such management as Dr. Sloan detailed this morning than any other one thing I have yet heard of in sanitarium management.

I was in the Lincoln school at Lexington, Ky., the other day,—a magnificent school. Every child in that school of tuberculous parentage, or who has any symptoms of tuberculosis, is in a special room up on the roof, in the open air, with wonderful facilities for the proper building up of his or her system. They get hot lunches, hot milk, regular exercise, their clothing is carefully laundered. This splendid care is lavished on tuberculous suspects or prospects. Why not apply it to every child in every school? The outrageous thing about this common school proposition as it is generally conducted, just as the outrageous thing about the high school, college or state university, in fact with practically every public school in the United States, is that they are not teaching the normal pupil how to live and what to do. Let your child here in Georgia go eight years through the common school, four

years through the high school, through the State University and Yale, Harvard or any of the great institutions, and they may learn enough to be Christian Scientists or some other faddists; they may get enough higher education to believe there is no disease,—to persuade their imaginations as to any of the things that the faddists have learned to believe and that are most commonly found in our great educational institutions and not amongst those, in our conceit, we are pleased to term the ignorant; but the time has come for you and me to insist that our school superintendents will do what Miss Yancey is doing—make available to every single child that is the ward of the state the knowledge of how to live and what to do that will prevent them from disseminating disease when they themselves are the victims of it.

Dr. L. J. Moorman, Oklahoma City, Okla.—First, I want to express my appreciation of Dr. Minor's paper. I am personally interested in this subject because I have some little girls of my own, and I am in touch with many children in whom I am interested.

What Dr. Shoulders has said about sending nurses into the home is good. There is no doubt about the efficacy of this method of tuberculosis control, and yet, in the state to which he referred, with five thousand deaths from tuberculosis in one year, a large part of the population consists of colored people, and those who have had experience in the management of tuberculosis know at once that it would be necessary to put a nurse in the home and keep her there constantly on the job to teach people of that type how to control or protect, for instance, the children there from tuberculosis. You can't go into a home and tell an individual even with average intelligence how to control tuberculosis and go away with implicit confidence in the fact that they are going to do it. The control of tuberculosis might be compared to what the surgeons have spoken of as surgical conscience or surgical cleanliness, and it takes training to arrive at this. Those who have had experience in the sanitarium management of tuberculosis are perhaps more impressed with this fact. It takes two or three months to teach people of average intelligence even in the sanatoriums how to be careful and how to protect others from tuberculosis. They forget; they are told today and they attempt to do what they are told today, but tomorrow they forget and it requires constant repetition. I believe that if this problem is ever solved it will be solved through both sanitarium and house-to-house visitation and instruction.

I believe there is one province in the world where tuberculosis has been practically stamped out, and that is the Province of Victoria, in Australia, and it has been done through government control in the home and in the government institutions. The patients in the home with tuberculosis are isolated and they are under government inspection. If they are found breaking the rules under which they were placed there, the second or third time they are required by law to enter an institution where they are under constant control. In addition, the people in this province have learned to live in the open air; they sleep out of doors, and consequently this province is comparatively free from tuberculosis.

They also have a law requiring examination and health certificates from every individual who moves into the province. So, I believe if we ever control the spread of tuberculosis it must come through concerted action and the combination of sanitarium treatment and the home treatment of tuberculosis.

In connection with Dr. Minor's paper I have seen two things recently of interest. One is the report of a series of experiments by Dr. A. K. Krause, of Saranac Laboratory, showing the difference in the virulence of the tubercle bacilli in two strains, both of which he has worked with for a number of years; he finds invariably strain 37, I believe it is, in the guinea pig doesn't produce death, and with the other strain he invariably gets death in the guinea pig; and the fact that he has carried it along for such a long time renders his experiments more valuable. Another is the work of Professor Ghon, formerly of Vienna, on "The Primary Focus of Infection in Children."

Dr. Minor (closing).—I have only a few words to say in closing. We have abundant scientific evidence as to childhood infection in tuberculosis, and we also know how to prevent such infection. Further, we have very good evidence that adults get a considerable amount of protection from acquired immunity, since the adult is already infected and since he has a considerable resisting power to the disease, the essential thing is that we turn our attention to the child.

Dr. Woo's case is a most interesting one, showing how necessary was intimate household contact for a long period of time to bring about any infection, and how well the adult resisted infection though exposed to it all the time.

Dr. McCormack's remarks on the American spitting habit are most excellent, and I only wish we could have all our children trained to think that promiscuous spitting was nasty, for this is the only way I can see of eradicating this habit. The weight of public opinion will do much more to stop it than all the laws that we can pass.

TRACHOMA: A DISEASE OF EQUAL IMPORTANCE TO THE OPHTHALMOLOGIST AND PUBLIC HEALTH OFFICER AND WHAT THE GOVERNMENT IS DOING TO ERADICATE AND PREVENT ITS FURTHER SPREAD*

By John McMullen, M.D.,
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Trachoma is a form of conjunctivitis which originates exclusively in infection

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from a trachomatous to a non-trachomatous eye. It is extremely chronic, lasting months and years, and, without interference, causes serious and permanent impairment of vision and frequently total blindness. The secretion is the medium which transmits the infection.

The history of trachoma dates back to antiquity and it has been customary to regard Egypt as its cradle and historic birthplace. It has been said that the origin of the disease might be summed up in the sentence: "Trachoma is as old as the Nile, the Simoon and the desert." Its communicable nature was known and feared by the Greeks centuries ago. It was even believed that the disease might be acquired by merely looking at an infected eye.

Out of all the confusing and contradictory observations which have been made in connection with trachoma, the communicable character of the affection stands today clear and undoubted. The terrible epidemic which raged over Europe during the last century rendered thousands of people blind in both the military and civilian population.

The distribution of the disease is world-wide and we are beginning to realize that our own country harbors the infection to an alarming extent and there is plenty of evidence that this disease is on the increase. A routine examination of our Indian reservations by the Public Health Service showed that many of them were heavily infected and the disease has also been found in various sections of the country. Trachoma is found extensively in the Appalachian Mountains, with the heaviest infection where the states of Kentucky, Virginia, West Virginia and Tennessee are adjacent.

A survey made by the Service in 23 counties in eastern Kentucky showed that 1,280 out of a total of 18,000 people examined were suffering from trachoma,—that is, about 7 % of the total number examined had trachoma. Of the number examined in this survey, 16,696 were school children. The type of the disease found was severe and its mutilating effects are seen everywhere. It would be difficult to appreciate the suffering and disastrous effects of the disease in Appalachian America without actually seeing these cases and witnessing the pathetic sights they present. It is here that most of the cases have gone without proper aid, and many without any at all.

The disease, untreated, lasts practically throughout the life-time of the individual, a constant bodily discomfort to himself, damages his eyesight and constitutes him a menace to his neighbor. Add to this the danger of its spreading on account of its infectious nature, and we appreciate what a veritable scourge it is in those regions in which it is endemic.

Like all communicable diseases, trachoma spreads in barracks, penal establishments, poor houses, orphan asylums, etc. Outside these institutions, however, the same conditions are found where people live crowded together and pay no heed to the commonest hygienic precautions—ideal conditions for the propagation of trachoma and other communicable diseases.

The secretion, the medium transmitting the infection, is conveyed by the use in common of such infected articles as towels, handkerchiefs, bed linen, etc.

Since the etiology of trachoma remains an unsolved problem and the diagnosis rests upon clinical evidence and more or less personal opinion, the endless question of differential diagnosis between trachoma and follicular conjunctivitis continues. When this question arises the case is at least suspicious and should, for public health purposes, be regarded as a case of trachoma until it has been proven otherwise. A child should not be permitted to attend school if he is classed as active trachoma or suspicious until cured of trachoma or the doubt of its existence removed.

As a result of the investigations by the Public Health Service into the prevalence of trachoma in the Appalachian Mountains, the Service was requested by the boards of health of the several states to undertake the eradication and control of this disease.

The work was first commenced in Kentucky, in 1912, in co-operation with the State Board of Health and afterward extended to the mountain sections of Virginia, West Virginia and Tennessee in the order named.

In considering the problem of the con-

trol of trachoma, it was realized that the chronic nature of the disease, the widespread infection and the conditions under which the work would necessarily be done would be great difficulties. An acute communicable disease could be quarantined until its termination by either recovery or death, but where the duration of the disease was one of years this was not to be thought of.

The people among whom this work was to be done have been described by Dr. Frost as "the super rural" and "our contemporary ancestors in the Southern mountains," and of whom Mr. Fox says: "People who have been among the Southern mountainers, testify that, as a race, they are proud, sensitive, hospitable, kindly, obliging in an unreckoning way that is almost pathetic, honest, loyal, in spite of their common ignorance, poverty and isolation; that they are naturally capable, eager to learn, easy to uplift. Americans to the core, they make the Southern mountains a storehouse of patriotism; in themselves they are an important offset to the Old World outcasts whom we have welcomed to our shores: and they surely deserve as much consideration from the Nation as the Negroes, or as the heathen, to whom we give millions." Among these people large families are the rule, and often a dozen live, sleep, cook and eat in a small cabin of one or possibly two rooms.

The custom of using the common family towel, wash basin, bed linen, etc., and the lack of individual toilet articles are further hindrances in this work.

Any plan to bring relief had to take into account these difficulties and the fact that many of the people live long distances in the mountains and far removed from railroads.

In the commencement of the work of eradication it was realized that, if anything like satisfactory or permanent results were to be obtained, it must be by properly and skillfully conducted surgical proceedings and hospital care. The question of prevention is almost wholly one of education. Eradication is a big task, but that of education is far more difficult.

The plan adopted, therefore, was the establishing of hospitals in the infected districts where they would be most accessible to those needing the help.

The first hospitals were established in 1913 and were about 25 miles from the railroad, and some of the supplies were hauled 45 miles across the mountains.

The Service now has a total of six hospitals in Kentucky, Virginia, West Virginia and Tennessee with a capacity of 120 patients, each hospital having about twenty beds. Six physicians who have had special training in eye work and a complement of trained nurses and attendants are on duty at all times to care for these cases.

These hospitals are situated at Jackson, London and Pikeville, Ky.; Coeburn, Va.; Welch, W. Va.; and Tazewell, Tenn. Upon admission to the hospital each patient is informed of the communicable nature of his disease and cautioned not to transmit it to others. Individual towels, basins, cups, etc., are furnished each patient for use during the stay in the hospital. Spitting upon the floor, a universal custom, is forbidden, and cleanliness is insisted upon. The doctors and nurses make regular talks to the patients in the hospitals on various public health subjects and the reason why the Government maintains the free hospitals is explained. The hospitals are conducted in such a manner as to give an object lesson to the patients, and upon returning home it is hoped they will emulate the example.

Dispensary patients are told the nature of their disease, the necessity of using individual toilet articles and given a copy of the trachoma pamphlet. After being treated all patients are furnished with a clean gauze handkerchief.

The doctors and nurses do district work and visit the homes in the remote sections to follow up some of the hospital cases, and to induce others to come in for treatment, etc.

The educational part of the work is also furthered by talks in schools, courthouses, churches, teachers' institutes, etc., and the distribution of popular trachoma literature on the nature and prevention of this disease.

During the fiscal year ended June 30, 1916, 3,571 homes with a total personnel of 25,000 had been visited in this manner. During ten months of this period one district nurse rode over 4,000 miles on horseback.

The water supply of 2,820 homes was as follows: wells, 1,338; cisterns, 2; springs, 1,459; and branch water, 21.

The toilet arrangements for 2,696 homes were: sanitary closets, 17; surface closets, 397; and no accommodations, 2,282.

In sparsely populated districts this nurse often rode 20 or 30 miles in a day. Some pathetic sights were witnessed when she found typhoid fever, tuberculosis or neglected obstetrical cases sorely in need of care, and she often delayed to give a bath or otherwise lend the helping hand of a good woman and a well trained nurse, leaving those good and honest but neglected people to wonder what changes could be wrought by knowing hands.

During the twelve months ended June 30, 1916, five of these trachoma hospitals (the sixth was established in August, 1916) had a total daily attendance of 19,530, and 112,055 individual treatments were given. There were 1,880 patients admitted to the hospitals and 1,687 operations were performed. Of this number 1,153 were performed under local and 534 under general anesthesia.

In addition to the work done at the hospitals, field clinics have been held in various sections for the purpose of arousing local interest and demonstrating to the doctors the various stages of the disease, its sequelae, the diagnosis and treatment. This is done in the hope that one or more of the doctors will take up and continue the work in his community. In a number of places this is now being done and regular trachoma clinics are held as the result of the Service field clinic. The field is such a wide one that this is necessary to accomplish the desired results.

These six trachoma hospitals are also used for educational purposes. Doctors and others interested are urged to visit them and see in detail how trachoma and its various sequelae are treated, and learn to perform the simpler operations.

The hospital yards are kept in good condition and not a little attention is paid to planting grass, flowers, etc., at all of the hospitals. At those hospitals where water closets are not used, a practical form of sanitary toilet is in operation for use of the patients and to demonstrate to them what can and should be done at their homes. Only active trachoma is admitted to the hospitals, but in the dispensary a great variety of conditions and diseases of the eye are treated among those who are either too poor or too remotely situated to consult a specialist. The ages of our trachoma cases vary from babyhood to old age. Our records show that at least one-half of the trachoma cases have impairment of vision. Ulcer and corneal opacity occur in about 25 % of the cases; pannus is present in 20 %; and photophobia was recorded in 33 1-3 %. Entropion and trichiasis were noted in 10 to 15 % of the cases.

The impairment of vision ranged between slight defects to total blindness. Treatment of trachoma is surgical in the great majority of cases and retention in a hospital varies according to its duration, severity, complications, etc.

In children, when seen early, the disease usually is readily eradicated, and they can return to school in a short time. A general anesthetic for the operation is usually necessary in small children and, when tonsils and adenoids are found requiring removal, this is usually done at the same time. The older cases require a longer time to effect a cure and post-operative treatment is necessary for a longer time.

As trachoma frequently has a latent period without subjective symptoms, it is often found, particularly in children, much to the surprise of the parent and child, thus emphasizing the importance of routine school examinations. In this way the disease is found in its early stages, and when it is usually readily removed before the corneal complications occur and with the minimum of days lost from school.

The operation employed for the cure of trachoma is a form of grattage, but the amount of traumatism depends entirely upon the individual case in hand, and what would be quite sufficient in one case would be inadequate in another.

The aim is to remove the abnormal tissue from the entire conjunctiva, and the operation is to be discontinued immediately after this has been accomplished. With the eyelid fully everted, this can be determined by the smoothness of the surface and the appearance of the small blood vessels.

Some form of grattage has been prac-

ticed in the treatment of trachoma since the time of Hippocrates, but upon the quality and quantity of this operation depends the result.

The operation as performed in the hospitals conducted by the Service in the Appalachian Mountains is done with a specially devised forceps for everting the eyelid, two small scalpels, horn spoon for protection of the cornea, Desmarres forcepts, tooth brush, bichlorid solution, one to two thousand, and plain sterile gauze. After everting the lid thoroughly, the field is scarified and the granules incised superficially with the scalpels, the surfaces gone over with the brush and the bichlorid solution followed by thorough use of the gauze. The operation can usually be done with local anesthesia, but in young children and very nervous patients a general anesthetic will be required. Immediately after the operation the conjunctiva is washed with boric solution with the eyelids everted in order to remove all blood clots and thus lessen the tendency to adhesions. When a radical grattage has been done, the eye should be under the surveillance of the surgeon or qualified assistant during the 24 to 48 hours succeeding the operation to prevent the occurrence of adhesions. After-treatment consists of cleansing the eyes every three hours followed by the use of 20 % Argyrol solution. After five or six days, if uneven, granular or rough surfaces are present, the lids should be everted and brushed lightly with a 1 or 2 % silver nitrate solution; this to be repeated as often as necessary and the individual case will stand.

The various sequelae are to be given the necessary treatment. Patients suffering with entropion, trichiasis, central corneal opacities, etc., can often be given the greatest relief and their vision increased by the proper surgical measures.

From the inception of this work it was realized that practically any case of trachoma which had existed for any length of time would have impaired vision and that some would be benefited by glasses. Each hospital was, therefore, supplied with trial cases.

The results obtained in this work are extremely gratifying. Adults who had suffered from trachoma for years and were dependent upon their friends or the county for support, some being inmates of the poorhouse, have been relieved, are no longer a menace and have taken their places in the community and are earning a livelihood for themselves and family. Children unable to obtain an education on account of the constant physical suffering and impaired vision are now in school securing an education, something which would always have been denied them but for the timely interference.

During the twelve months ended June 30, 1916, more than a thousand cures had been examined and recorded at the hospitals. This, however, represents only those cases which were seen and, therefore, known to be cured. The majority of our patients live long distances from the hospitals and, once the desired relief is obtained, never think of returning for inspection. Their history cards, therefore, are never completed as to the result. It is a very conservative estimate that at least 50 % more have been cured, and who can say how many thousands have been saved from the manifold miseries wrought by trachoma by thus removing these many hundreds of foci of infection?

It must be remembered that a majority of the patients treated in these hospitals are without means, would otherwise never have been given relief, and would have remained a menace to the community.

The results obtained by the methods adopted by the Service in the eradication and control of trachoma show conclusively that this infection can be controlled, and the work should be continued until this result is obtained.

The several boards of health, town and county authorities and the medical profession in those states where this work is being done have given their hearty co-operation.

DISCUSSION

Dr. J. A. Stucky, Lexington, Ky.—I do not believe the average physician living in the mountains of Kentucky and Virginia, and even in the heart of these states, appreciates the gravity of this disease, trachoma. We have heard of granulated sore eyes all of our lives. In the clinics in the large cities we do not meet with these cases, and as Dr. McMullen has said, the larger number of serious cases are found away back in the mountains twenty-five to fifty miles from a railroad. These people are mountain locked;

they are held back by civilization and will not get help unless it is carried to them. The majority of them never saw a railroad; are frightened when they see and hear an engine for the first time. But this is beginning to be a national menace; railroads are now going to these hotbeds of trachoma and the trachomatous patients are being brought to the cities. Lexington is the gateway to the mountains of eastern Kentucky, and until the Government service took charge of this work, I was seeing cases in increasing numbers every year. When I made my first trip I was amazed at what I saw and so would you be. It is the duty of the medical profession to teach the people to become interested in the eradication of this disease. It is increasing in central Kentucky. We find it in our city schools; we find it in the best families, and it is a reproach to ophthalmology, to the science of medicine, that the etiology of this disease has not been discovered. It is hard to get an audience that will listen to a lecture or to a description of this disease on the conservation of vision. We can do nothing unless we educate the people. We are sending $10,000 a year across the sea to people who do not know our language, and yet we are not spending 10 cents to save true Americans, the real Anglo-Saxons of the race, in the mountains of eastern Kentucky and Virginia. The pain, the misery, the blindness, the suffering of these people is indescribable, and if Dr. McMullen and I were to tell you one-half of what we have seen with our eyes, and if these trained nurses could describe what they have seen, it would sound more like fiction than reality, and it is time for us to wake up and stamp it out as we have yellow fever and other diseases.

Dr. John A. Ferrell, New York, N. Y.—I wish to express my appreciation of the work of Dr. McMullen in ascertaining the prevalence of trachoma in this country and the excellent results he has obtained in bringing the disease under control. He is a real pioneer in the field of public health.

Trachoma has been found prevalent in a number of other countries, including particularly Egypt and Brazil, where public health measures have been undertaken for its relief and control. In this entire field the work of Dr. McMullen in this country and Dr. MacCallan in Egypt is unique.

While in Kentucky several months ago I visited one of Dr. McMullen's trachoma hospitals. It was a revelation to me to observe the large number of patients who had traveled many miles for treatment. The severity of the disease was quite striking. Many of the patients on entering the hospital could scarcely see and found it necessary constantly to protect their eyes from the light.

I am glad to have this opportunity to express my appreciation and commendation of the very valuable work that has been developed and directed by Dr. McMullen. It is to be hoped that his effective working methods may be adopted in other fields where the disease prevails.

I would like to move that a resolution be drafted commending the work of Dr. McMullen and urging the legislative bodies of this country to give whatever additional aid may be necessary for its proper extension.

Seconded and carried unanimously.

Dr. McMullen (closing).—What Dr. Stucky has so ably stated about remedying the condition of a great many people who suffer from trachoma is true. The fact is that these regions in the Appalachians have recently come into prominence on account of coal mining and causing railroads to be built, as a result of which those people who live in the mountains find their way into other communities and they should not be permitted to carry with them this communicable disease. These people have a right to expect an equal chance with their neighbors, and this is denied them if they keep their trachoma.

The public health work which we are doing has some advantages in some respects, as the relief afforded is often remarkable. In this disease we sometimes get rather spectacular results in the way of cures, and when a patient returns home he advertises the work because he has been cured of his trachoma and his vision is markedly improved.

In making a talk some time ago on trachoma some one asked what we did with these old cicatricial cases, cured so far as active trachoma was concerned, but with pannus and all those things which we fear as a result. I promptly told him that we used them as boosters. With the proper entropion operation the pannus usually disappears as do the active corneal ulcerations, and vision is so much restored that the patient goes back home practically a new man, and that is what I mean by somewhat spectacular results.

I am glad that Dr. Goldberger made the point of additional funds for the prevalence of trachoma is far more extensive than we realize and the trachoma campaign should be extended. This is particularly true in regard to the field work.

In the routine school examination, if trachoma is diagnosed early and promptly, and properly treated, the child can usually return to school within two weeks. The average incipient case found in the schools is usually not difficult to cure, provided the proper surgical methods are used.

We have a number of doctors under treatment who have contracted trachoma in the Appalachians. One of our doctors who was in charge of one of the trachoma hospitals contracted the disease and has been obliged to discontinue active duty for a time.

AUTHORS' ABSTRACTS

Public Health

The Work of the Division of Sanitary Engineering of the West Virginia State Department of Health. Mayo Tolman, Chief Engineer, West Virginia State Department of Health, Charleston, W. Va. The West Virginia Medical Journal, January, 1917, p. 244.

Public health work should proceed along two lines, namely, (a) the reinforcement of the human organism in its struggle with disease-producing microbes, and (b) the exclusion of these microbes and their destruction in the environment. Some diseases, notably smallpox, may be

warded off by increasing the vital resistance of the human body, while other diseases, as typhoid, may be prevented by improving the physical surroundings of that body. As his training causes him to study communities at large, while the physician's viewpoint deals primarily with the individual, the sanitary engineer is best fitted to control those improvements that are instrumental in warding off disease.

Sanitary engineering embraces the design and construction of all works contributing to the public health, and all means of preventing offensive conditions due to large numbers of persons living in closely-built-up communities. It is the duty of the sanitary engineer to see that these public works are so constructed and operated that they are conducive to health and comfort. It quite frequently happens that sanitarians become so enthusiastic over bettering health conditions that they lose all sight of relative values, and do not balance the cost of benefits against their value.

Realizing this, the Division of Sanitary Engineering has at all times carefully weighed the benefits to be obtained from any proposed measure before urging it upon a community, and has endeavored to help towns solve their present health problems before forcing others upon them.

AUTHORS' ABSTRACTS

Medicine

(Continued from page 115

On the Growth of Medical Knowledge Concerning the Malady Known as Infantile Paralysis, Acute Anterior Poliomyelitis, or the Heine-Medin Disease. Lewellys F. Barker, Baltimore, Md. The Charlotte Medical Journal, December, 1916, p. 257.

The paper deals with a brief historical account of the early descriptions of infantile paralysis by Heine and Charcot. The important contributions of Medin (1890) and of Wickmann (1905) are referred to, and the careful studies of the disease in recent epidemics in Europe and in this country briefly summarized. The etiology, epidemiology, prevention and treatment of the Heine-Medin disease are described in the light of knowledge as it exists at present.

Two Modern Methods to be Employed in the Treatment of Chronic Eczema. Chas. J. White, Boston, Mass. Journal of the American Medical Association, January 13, 1917, p. 81.

The investigations of the last three years have been carried on with the idea of throwing some light upon the vexed question of the etiology of eczema. The writer has been long impressed with the idea that there is some definite and possibly explicable cause for the susceptibility of certain individuals to external irritants, while others, be they infants or adults, when exposed to the same noxious influences, remain unaffected. Thus the work has been pursued upon the premise that eczema is produced by an external irritant working upon a sensitized skin. The question to be solved, therefore, was the nature of the occult sensitizing agent.

Following the lead of certain pediatrists, work was begun to prove or disprove the theory that food intoxications were the sensitizing agents in man's susceptibility to eczema. For this purpose the so-called food tests were made on the healthy-appearing skin of many people afflicted with chronic disease. For the first year and one-half, raw foods, representing the various types of man's diet, were inoculated into superficial, clean scratches (a positive reaction being represented by the formation of a delicate pink papule about the seat of inoculation). For the last year and one-half, powdered proteins have been employed. The result has been to discredit the value of these latter agents; but the writer is convinced from his now somewhat extended experience with raw foods that a positive reaction to carbohydrate, to fat, or to protein should mean the partial or total elimination of the incriminated type of food from the patient's diet and that in certain individuals following such withdrawal there is an amelioration of symptoms hitherto unobtainable by previous drug treatment alone.

The second line of investigation has been microscopical examination of feces. It is not argued that stools, even of presumably normal individuals, may not reveal excesses of undigested fat, starch or protein; but these investigations have demonstrated that people with chronic eczema are very apt to show in their feces such an excess of starch or fat (apparently never of protein) and that following this clue and reducing or eliminating the type of food thus discovered, clinical results, previously impossible to achieve by external or internal medication alone, have ensued.

The Diagnosis of Gastric Ulcer. John W. Shuman, Sioux City, Iowa. The Journal of Laboratory and Clinical Medicine, December, 1916, p. 189.

Gastro-duodenal ulceration is to be only suspected if the subjective symptoms—hyperacidity, hunger-pain, food-ease and hypersecretion—are complained of. Physical examination must reveal a raw spot in the mucous membrane. This is found ,if present, by the aid of a No. 14 braided-silk cord and lead ball, which is left in the stomach 6 to 12 hours. The relative size and location is interpreted by this test as well as the presence of an ulcer. The use of the duodenal tube is also described. For differential and confirmatory gastric tchnic the author lays much stress upon Roentgenology. Examination is made as the opaque meal passes into the stomach. Deformities are noticed, especially about the antrum and pylorus and first portion of the duodenum. The most important findings are deformities: (1) a diverticulum, (2) incisura, (3) a deformed cap (all must show constantly through a series of records, i. e., plates), (4) hyperperistalsis, and (5) a large six-hour residue are highly suggestive. And if in addition (1) is present, an ulcer is positive. If a deformed cap or duodenum is present constantly, the diagnosis is duodenal ulcer. Two cases are reported for comparative study in differential diagnosis. Both complained of "stomach trouble," and both had been, previously diagnosed as "gastric ulcer." One had an ulcer of the duodenum, the other had chronic appendicitis. The opaque meals are illustrated in the text. Shuman concludes that many diseases simulate gastric disease (ulcer) until a thorough examination is made.

SURGERY, GYNECOLOGY, OBSTETRICS AND GENITO-URINARY DISEASES

SURGERY OF CHRONIC ULCER OF THE STOMACH AND DUODENUM WITH REMARKS ON CANCER*

By William D. Haggard, M.D., F.A.C.S.,
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The *ars mendendi,* defined by Hilton Fagge as the art of detecting, relieving and preventing disease, must concede that her hand-maiden surgery has in the last two decades done much to encompass the brilliant results now obtained in the grave diseases of the stomach. Surgery has uncovered the real lesions during their active stages in the life-time of the patient and written a new pathology. It has established a startling relation between ulcer and the dread destroyer, cancer. It has disentangled the symptomatology of "chronic dyspepsia" and given each entity its true evaluation. It has after some mortification determined that painless indigestion is functional or neuropathic. It has about banished the term "chronic gastritis" as a blanket diagnosis for the multifarious conditions of the upper digestive tract. "Hyperchlorhydria," or "acid dyspepsia," has been correctly interpreted as duodenal ulcer.

The stomach tube of the earlier gastro-enterologist has been shown to be of as little value in the treatment of most stomach complaints as the catheter is in the treatment of prostatic hypertrophy. The elaborate chemical tests have been proven of only subsidiary value. The true worth of the carefully-taken clinical history has been triumphantly verified and its relationship to the lesion firmly established. The X-ray has been utilized as an uncanny but truth-telling witness in the gastro-intestinal tract; and finally surgery has evolved a perfected and highly efficient series of operative procedures to conquer the distressing and death-dealing diseases of the stomach.

Acute ulcer is relatively unimportant and usually subsides under medical management. Chronic indurated ulcer is doubtless chronic from the start. Formerly chronic duodenal ulcer was thought to be very rare. It occurs three times as often in men as in women. On account of its preponderance over gastric ulcer in the ratio of 3 to 1, it may be said to explain the majority of cases of painful digestion in men of middle age.

Cancer of the stomach was only of clinical interest as the lethal symptoms were slowly unfolded and their melancholy story finally interpreted prior to death. Now we are intensely concerned in its very beginnings, because, as Bland Sutton says, "the ulcer of today may be the cancer of tomorrow."

In the study of individuals with gastric symptoms it must be borne in mind that nearly one-third have some general disease, such as arterio-sclerosis or nephritis, almost another third have other abdominal lesions, as appendicitis or gall-stones, practically another third have one of the generau neuroses, with gastric symptoms, leaving a scant 10 % who have actual lesions of the stomach and duodenum itself.

Still, Gruber estimates that 75 % of duodenal ulcers are not diagnosed during life, and Wilkie found in five hundred autopsies that only one in seven duodenal ulcers had been diagnosed before death. Rosenow has demonstrated streptococci in peptic ulcers, which, when injected into animals, have a marked selective action for the stomach and duodenum. His experiments would seem to designate streptococci as the original cause, as well as the most important factor in preventing the healing of the ulcer.

The favorite site for a duodenal ulcer is in the first portion of the duodenum. Over half of them extend up to within three-fourths of an inch of the pylorus. It may well be that the acid chyme in-

*Oration on Surgery, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

jected in jets against this area is provocative. Ulcers never occur below the entrance of the alkaline biliary and pancreatitic secretions.

The story of a typical duodenal ulcer is very characteristic. Sir Berkeley Moynihan said that the diagnosis can be made by correspondence. In typical cases which represent over 50 %, the pain occurs regularly from three to five hours after meals and is regularly relieved by food. The time of occurrence of this pain indicates roughly the location of the ulcer. The lower the ulcer in the stomach, or duodenum, the later the pain appears after eating. It may be so late after taking food that it is nearer the next meal and is, therefore, spoken of as "hunger pain," with the characteristic relief from food. About one out of seven patients have definite pain occurring after midnight, which is relieved by taking food. Pain or distress occurs in spells of weeks or months and alternates with periods of more or less entire and complete relief. As a rule there are hyperchlorhydria and excessive secretion. Seventy-nine per cent. have vomiting, but only one-third have hemorrhage. There is a seasonal incidence in nearly half of the cases. The spring and autumn months seem to be the most noticeable time.

The pain or distress coming on at a rather definite time, occurring regularly during a given attack day after day, that is relieved by eating, vomiting or alkalies, will make the diagnosis in 80 % of the cases. In the other fifth the symptoms are incomplete, inconclusive, irregular or wanting. Moreover, they may be complicated with symptoms referable to the gall bladder, pancreas or appendix. As a matter of fact these complications actually occur in the presence of duodenal ulcer in 16 % of the cases. They may so limit the symptoms that a diagnosis of duodenal ulcer will be made when the real pathology is located in one of the abdominal organs.

Gastric ulcers are less frequent than duodenal, but are more dangerous. If perforation occurs, there is less chance of adhesive protection. A greater amount of fluid escapes, with a greater likelihood of infection. Operation for its correction is more severe. Distortion and crippling adhesions frequently result. The danger of cancer from an overhanging margin of the ulcer or from small portions of the gastric mucosa buried in scar tissue have been proved by Wilson and McCarty to occur in 72 %. On the other hand, an inflammatory tumor often forms that may simulate carcinoma. Our earliest clinical lessons in the curability of gastric ulcer by gastroenterostomy came as the result of the unexpectedly brilliant results from this operation in cases where the tumor or ulcer was misinterpreted as cancer. The converse, however, is true. Sixty-eight per cent. of ulcers that have been excised have shown a tendency to cancer. Von Eiselsberg, of Vienna, read a splendid paper on ulcer before the Clin-

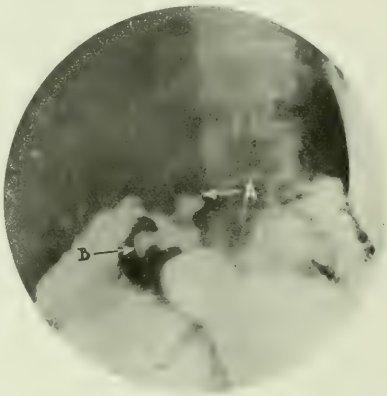

Fig. I.
Duodenal Ulcer showing irregular filling of duodenal bulb. (From Leonard & George.)

ical Congress of Surgeons, in London, on the fatal Wednesday night before Germany declared war. While reading this paper the message came recalling him to his post as Surgeon-General of the Austrian Navy. In this paper he said that 10 % of the cases he had operated upon for gastric ulcer subsequently died of cancer. When this fact is keenly appreciated and the dangers and disability of gastric ulcer is considered, it can not be gainsaid that in its chronic form gastric ulcer is essentially a surgical lesion. Any ulcer attaining the size of a 25-cent piece is either now or likely to become malignant.

Gastric ulcer in its symptom complex is not so clear-cut and characteristic as duodenal ulcer. The food distress comes on earlier. The acid values are not quite so high and there is a gross retention in about one-third of the cases. Vomiting occurs in 82 % of cases and hematemesis is a little more frequent.

The X-ray shows a spastic incisura opposite many of the ulcers. The changes in the size, shape and position of the stomach are very characteristic. Often the crater of a deep ulcer will be shown as a filling defect. The niche, or accessory pocket, of a penetrating ulcer is demonstrable. If there is obstruction, the fluoroscope shows hypertonus, hypermotility and hyperperistalsis. The six-hour

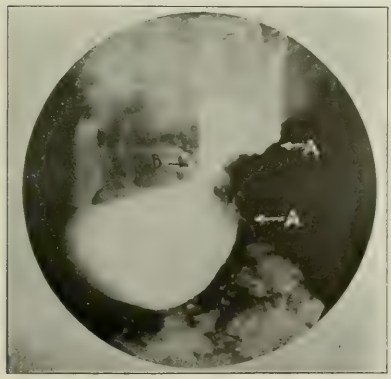

Fig. II.
Cancer of Stomach, showing filling defect posterior wall. A-A. (From Leonard & George.)

retention of the barium meals is significant. In duodenal ulcer the absence or the irregularity of the duodenal bulb (Fig. I) and in some instances the branched pine tree shape of the duodenum, together with the other topographical signs, are often conclusive. Erosions, however, of the mucous membrane of the duodenum have no effect upon opaque media and show no change. They may give rise to severe hemorrhage and be very dangerous without showing anything by the X-ray. On the whole, negative X-ray findings taken in connection with the history and the laboratory examination, are fairly conclusive. In cancer the filling defect or the interruption of peristaltic waves are the most important signs (Fig. II.)

The question of permanent cure of chronic ulcer by medicinal and dietetic means is not regarded by most men as being readily obtainable. The remission of symptoms in ulcer are so notorious, even without any specially well-carried-out treatment, as to be looked upon really as diagnostic. The ulcer, if operated upon during this quiet period, is regularly found unhealed. Moreover, the X-ray evidence is usually little changed during the abatement of the symptoms. It is well demonstrated that the regimen of alkalies and frequent ingestion of an appropriate dietary will give prompt and brilliant symptomatic relief. The test comes, however, when these individuals, as pointed

Fig. III.
Posterior Gastroenterostomy. (After Mayo.)

out by Mayo, resume, as they inevitably must, "the regular diet of the grade and character obtainable by the average man." Inasmuch as several series of cases put the average duration of symptoms before operative relief at from ten to twelve years, it would seem that the majority of cases now submitted to operation have had ample opportunity for a natural or medicinal cure. Every chronic ulcer of the stomach or duodenum, therefore, that has not yielded to thorough and intelligent medicinal supervision should be subjected to operation. Woolsey limits the number of relapses to two (Fig. III.)

Gastroenterostomy, although an indirect method, has had very brilliant results, particularly in pyloric obstruction

and in duodenal ulcers. A great deal has been written about closure of the pylorus, to prevent food from going over the ulcer at all, and to force all of the food through the new anastomatic opening. The results, however, on the whole are not conceded to be any more satisfactory than those obtained by gastroenterostomy in properly selected cases. Pyloric occlusion should be employed in certain threatened perforations, in connection with infolding, or, if there are hemorrhages, in connection with suture ligation of the tributary blood vessels. Infolding of the ulcer with Lembert sutures is a useful and satisfactory procedure. Excision of the ulcer, if small and located superiorly, is efficacious, and there is no great objection to its performance (Fig. IV.) But Deaver,

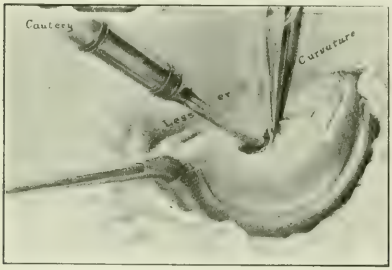

Fig. IV.
Ulcer destroyed by actual cautery. Burned area to be closed by suture. (After Balfour.)

who is the greatest advocate of excision, has well said: "No ulcer should be excised when subsequent closure and anastomosis present two great operative hazards." This is particularly true of ulcer low down in the duodenum and those which have penetrated the head of the pancreas. If in doubt about the wisdom or safety of an excision Paterson says do a gastroenterostomy.

The opposite is true, however, in gastric ulcer, in spite of temporarily satisfactory results from gastroenterostomy. The danger of hemorrhage and especially of malignant degeneration should encourage us to excise every gastric ulcer wherever possible. If, however, the ulcer is located on the lesser curvature, in addition to a V-shaped excision, a gastroenterostomy should be performed at the same time in order to prevent irregular contraction of the stomach with inability to empty itself freely of its contents.

In 1904, Rodman, recognizing that 80 % of gastric ulcers were in the pyloric end of the stomach, advised a pylorectomy or partial gastrecomy in cases where the ulcer simulated carcinoma and where the patient was in good condition.

For ulcers on the anterior wall near the lesser curvature of suitable size, Balfour has devised the plan of destroying them

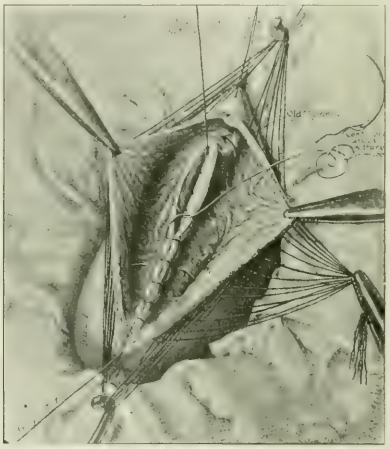

Fig. V.
Gastro-duodenostomy (Finney's operation), suture of posterior wall of anastomotic opening being completed. (After Finney.)

by the actual cautery and then closing them over by suture, reinforced by the fatty portion of the lesser omentum (Fig. V.) It is very useful, safe and simple and has a limited, though well-marked field of usefulness. It is not inappropriate to do a gastroenterostomy at the same time to insure rapid emptying of the stomach and the chemical change that is supposed to be effected by gastroenterostomy.

In the large saddle-shaped ulcer transgastric excision is the operation of choice. It seems that the patients do better who have both curvatures resected at the same

time so far as their subsequent motility and freedom from distortion is concerned. Resection by the sleeve method is extremely efficacious in these cases. If the ulcer has caused hour-glass contracture, then a gastro-gastrostomy or a gastro-enterostomy of the proximal loculus should be chosen. In healed ulcers near the pylorus, but causing stenosis, gastro-duodenostomy by the very satisfactory method of Finney is indicated (Fig. VI.) The operation can be most advantageously utilized by extending its application to those cases where an active-pre-pyloric or marginal duodenal ulcer can be excised and closed by this simplified form of pyloroplasty.

A bad result in gastroenterostomy is

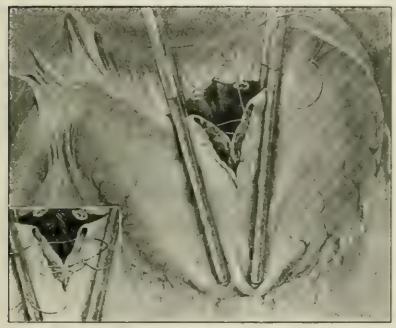

Fig. VI.
Excision of Ulcer on or near lesser curvature. (After Moynihan.)

usually due, in the opinion of Mayo, to bad selection of cases, faulty mechanics or to a permanent non-absorbable suture hanging in the anastomatic opening and causing a jejunal ulcer. The ubiquitous neurotic with gastric symptoms is the unwitting cause of many of the failures of surgical effort. They have the operation all right, but they do not necessarily have the ulcer. In many cases where the ulcer could not be demonstrated the symptoms seem at the time to warrant the operation being carried out in the hope that the patient might be benefited. It is little wonder that this group has received no benefit and throws discredit upon an otherwise satisfactory operation.

Ulcer of the stomach must be actually demonstrated by the tell-tale scar on the peritoneal surface and its hard margins must be felt. The duodenal group, situated distal to the pyloric vein, can be demonstrated by the puckering of the serous covering and the red stippling sign which Sherren described and which Scudder says is pathognomonic in determining the benignancy of the lesion. So far as my own cases are concerned, particularly of the duodenal class, I have been obliged to reoperate upon less than 2 % after gastroenterostomy, and in these cases pylorectomy, closure of the pylorus or excision of the ulcer has been satisfactory. While animal experimentation has shown the closure of the artificial stoma,

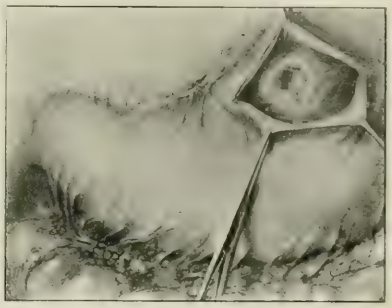

Fig. VII.
Transgastric Resection Ulcer Posterior Wall Stomach. (After Mayo.)

I believe with Kocher, Hartmann, Woolsey, Brun, Kuttner, Sherren, Peck and others that in the human subject a well-placed gastroenterostomy often persists almost indefinitely, particularly in those cases which are clinically cured. Many large series of cases have been demonstrated roentgenologically where the stoma was still patent for a long period. In one of my own cases, after eight years, a gastroenterostomy was still working and the patient was well all of this period. That a certain number close is well recognized. Paterson says 8 % of cases of ulcer were cured by gastroenterostomy. Another series found 22 % out of twenty-four in perfect health, and in another series thirty-two out of thirty-seven cases

of gastric ulcer were quite well. Fifty-eight Roosevelt Hospital cases traced by Peck, in which gastroenterostomy was almost the routine, were completely cured and free from former gastric symptoms. Kuttner in 1,100 cases, chiefly gastroenterostomy alone, reported 65 % of complete cures and 20 % very essentially improved.

In the dire catastrophe of perforation of a peptic ulcer, early recognition and prompt operation are the great desiderata. If operation can be done in the first few hours of the disease, the mortality, according to Gibson, is not over 5 %. A perforation of the duodenum in many of the cases is directed to the outer side of the colon by the hillock of the hepatic flexure of the colon and drains down into the appendiceal region and thus simulates acute appendicitis. Nearly half of the cases that have been operated upon for perforated duodenal ulcer have been preoperatively diagnosed as appendicitis. If the appendix does not show evidence sufficient to cause the symptoms, particularly if free fluid should be found, a second incision should be at once made over the upper right quadrant and a search instituted for the perforation. Closure with silk and appropriate drainage is usually satisfactory. Perforation, if recovered from as the result of a prompt operation, is perhaps a blessing in disguise, as a great majority of the ulcers that are so perforated never give rise to any further trouble. However, it may be wise to trim out the indurated and ragged edges before suture. The question of doing a gastroenterostomy at the same time is one of judgment and not of necessity. If it will not require over a few minutes and the patient is in good condition and the peritonitis is not too far advanced, it would perhaps be the part of wisdom. It should not, however, be superimposed upon a bad risk for the sake of completeness of the operation or the remote result. In one series of the Mayos of 272 cases, 66 perforations occurred. Sixteen were acute, 13 subacute, and 37 chronic and protected by adherions.

Acute hemorrhage will usually respond to medical measures with rest in bed. If it is recurring and severe, operation should be performed, one can ligate the vessels or control the hemorrhage by suture. It is unwise to open the stomach. Moynihan contents himself with a gastroenterostomy. If the hemorrhage is very severe direct transfusion of whole blood may be employed. Rodman has said that the more serious the symptoms the greater necessity for leaving the patient alone. He was able to control the otherwise hopeless cases by administering eight or ten ounces of water at 130° F.

Cancer remains the rampant and unbridled scourge of mankind. One-third of all of its hopeless victims are seized in the stomach. There were nearly 50,000 cancer deaths in the United States in 1913. If approximately one-third occur in the stomach it means that nearly 17,000 succumbed to its deadly ravages. It is the one disease that is relentlessly and inevitably fatal. Surgical removal is the only remedy, and yet is not partial gastrectomy relatively the rarest operation in surgery? When one thinks of the multiplication of operations upon the appendix for a disease that, while treacherous enough, is far from being universally fatal, and then contrasts our apathy and indecision in offering the only succor to the most murderous disease that afflicts mankind, it makes our efforts seem amateurish and puerile.

I am not unmindful of the very great difficulties that beset the diagnosis of cancer of the stomach, and indeed of any internal malignancy, which is of itself symptomless. I unreservedly urge a keener scrutiny into the chronic digestive case and the employment of every modern accessory to diagnostic completeness. Our profession would make a better showing in the detection of this most insidious and lethal malady; if our dependence upon its late and antemortem symptoms for diagnosis were forgotten; if our preconceived pessimism in its treatment were unborn. It were better if we could obliterate the traditions that make us well-nigh oblivious to the possibilities in the conquest of cancer. If the fetters of our imagination could be loosened; if the flood of light that has beaten upon the stomach from recent surgical demonstration were our sole torch; if we could start afresh with only our new knowledge, our revised pathology, our perfected surgical measures, our substantial

results in the permanence of cure in cancer, it would be a great boon. If we could approach this colossal task with the enthusiasm that characterizes scientific invasion of new fields, the cancer story would be illuminating.

It is derogatory that operative intervention is had in many conditions that of themselves are not fatal and the surgeon must needs practice great self-restraint to refrain from operations that he is constantly urged to do. The much-to-be-pitied and sadly exploited neurasthenic is the worst sufferer. There ought to be a closed season for neurasthenics, as for deer. The patient, always, and the physician, too often, clamor for operation in the hope perchance that some trouble may be found. Would that this type of exploration would cease and intelligent exploration of suspicious gastric cancer be more employed. We are inclined to wait too long for the very confirmatory symptoms that when they appear contraindicate any surgical effort. Early operation — diagnostic—after all other resources have been employed is the needful thing. It is withheld because, perchance, there has been no vomiting of blood, or tumor perhaps is absent, or cachexia is not of sufficiently deep shade and because, forsooth, there is not complete absence of H Cl. What we want is the acid test of the operating room instead of the acid test of the laboratory!

Cancer can be detected in its early stages by the X-ray if there are symptoms enough to lead to its employment. Even small growths will show a persisting irregularity of contour and a diffuse or infiltrating growth will show absence of normal peristalsis fluoroscopically. Filling defects are very characteristic.

A man of fifty with an attack of digestive pain that persists longer than its wont is unmitigated by the usual remedies that give relief; that is associated with loss of strength, of appetite, with anemia, without other explanation, means in all probability that his pre-cancerous ulcer has, after years of sullen threats, finally become malignant. Or an individual that suddenly and for the first time has a progressive and continuous attack of stomach distress that is inexplicable from the standpoint of any other determinable condition may soon endure the "agony of a living death." At present less than one-half of the cases when seen by the surgeon are operable.

It may be said that operation is imperatively indicated in progressive gastric distress that gives positive X-ray findings that is not improved under reasonably short observation and that presents one or more of such collateral signs as (a) gastric stasis; (b) blood in stools; (c) impaired digestive power; or (d) marked diminution or absence of hydrochloric acid.

It has been shown at the Mayo Clinic that the radical operation for stomach cancer gives more than 90 % of operative recoveries, over 36 % of three-year cures and at the outside 25 % of cures for a period of five years. By the anoci method, Crile and Lower have performed 127 consecutive resections with only two deaths.

The choice of operation will be (a) the partial gastrectomy, Billroth No. 2, done in one stage, or as is sometimes advisable in badly starved subjects, by completing only the gastroenterostomy and allowing the patient to recuperate before the resection. (b) The Polya operation, where the opening in the side of the jejunum, less than a foot from Treitz's ligament, is sutured to the cut end of the stomach. This gives the ability to extend the line of section further on the wall toward the cardia as no gastroenterostomy will have to be done, thus saving that additional time.

I will not go into the minutiae of the many ingenious and perfected operations, but the assertion can be most confidently made that in surgeonship and clinical values the mechanistic side of the surgery of the stomach is one of the most enduring monuments that is being erected to man's humanity to man.

SUCTION DRAINAGE IN EMPYEMA*

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Suction drainage in empyema began with the work of Potain, in 1869, and that

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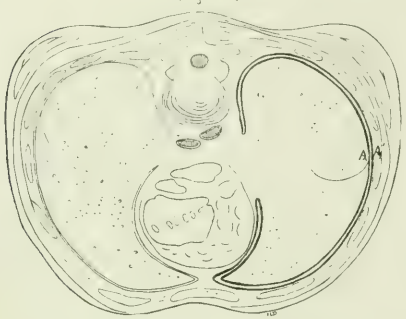
of Playfair, in 1872. Bülau took up the method and showed how syphonage included aspiration. Especially in Germany the entire subject of syphon and suction drainage has become associated with the name of Bülau. Bryant,[1] in 1906, published a history of the subject with the description of a method of his own. Since

Figure 1



Diagrammatic cross section of thorax to show the relation of points of A and A1 on the visceral and parietal pleural surfaces when the lung is in normal expansion.

that time Robinson[2], Schley[7] and Van Eberts[3] have added contributions to the subject. Perthes' classical article has put the method on a firm pathological and physiological foundation.

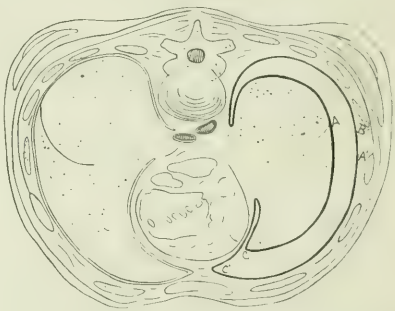
The healing of an empyema depends upon two separate factors: (1) the control of the suppuration, a biological problem depending upon the patient's resistance after proper drainage has been provided; and (2) refilling of the abscess cavity, a mechanical problem which may be solved by the following factors: bulging of the diaphragm and the mediastinum into the cavity; collapse of the chest wall, and dilatation or re-expansion of the lung. As a rule all of these factors combine to obliterate the cavity, but a physiological restoration of the chest is possible only by the re-distension of the lung.

Although there is no doubt that a certain degree of re-distension occurs after operation in acute empyema without regard to the method of drainage used, this re-distension will not take place with any desirable rapidity or certainty unless some form of suction is employed in order to assist re-expansion in an active way.

Without an artificially produced negative pressure in the thorax, re-expansion of the lung after empyema depends upon the inspiratory pressure within the lung forcing the two layers of the pleura into contact and the development of adhesions. The resultant position then becomes a point of departure for further excursions, and the lung in this manner creeps along the chest wall. The slipping of the diaphragm and the wall of the mediastinum and some flattening of the chest wall assist more or less in the obliteration of the cavity. The diagrams adapted from Perthes show how it is impossible to have a physiological restoration by this method of healing.

The value of any operation for empyema should be judged by the length of time required for healing and the number of persistent fistulae following its use. The immediate mortality rate may be

Figure 2



Showing the altered relation of the points A and A1 when the lung is compressed by an empyema or collapsed by a pneumothorax. The lung shrinks on its hilus and is crowded in the direction of the vertebral column. Point A, therefore, is no longer opposite A1, but corresponds with B1 on the chest wall.

misleading, because this must include death from various complications. Robinson (loc. cit.), restricting the term empyema to a collection of pus within a cavity whose walls are made by two layers of pleura, says: "Chronic empyema is a condition which should not exist, and which is in each and every case attribut-

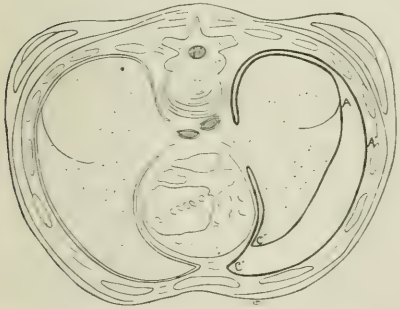
able to neglect either in the recognition of infection at its early stages, in its operative treatment, or in its post-operative management."

While the duration of the suppuration must have an influence upon the power of re-expansion of the lung, Perthes shows that the average duration before operation is only four-tenths of a day more in the cases ending in fistula than in those which healed after the primary operation, under ordinary forms of drainage.

The statistics of Wilinsky[5] covering the years 1903 to 1913 may be considered as representing the general results of treatment without suction drainage. In 299 cases the average stay of the patients in the hospital was 44 days. There was a mortality rate of 23 %, and of those that did not die, fifty did not heal properly,—about 23 %. Twenty-eight of these fifty had secondary operations, and four died.

This report is based upon an experience with 24 cases of acute empyema treated

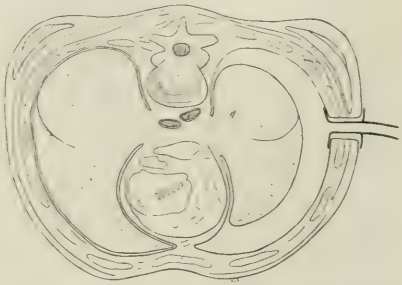
Figure 3



Showing obliteration of the posterior space by adhesion of the two layers of the pleura. Note that point A on the lung becomes fixed to the parietal pleura at a distance from A1, and that the line C-C1 is lengthened. Emphysematous dilatation of the lung or collapse of the chest wall will be required to obliterate the cavity. C1-C-A.

by suction drainage. These patients came under my care in the Mercy and St. Agnes' Hospitals, Baltimore, during the past three years. For comparison, I have taken an equal number of cases which were treated by ordinary drainage during the years immediately preceding 1914. Four patients died, a mortality of about 17 %. In one of the fatal cases the empyema was part of a general pyemia following lateral sinus thrombosis, and in another death was caused by a complicating cerebral abscess. The mortality rate in the earlier series was 25 %, and here again one fatal result was due to cerebral abscess.*

Figure 4



Showing the even expansion of the lung when negative pressure is provided in the pleural cavity by suction drainage.

There were no fistulae or secondary operations in the suction cases. In the earlier series there were two cases requiring secondary operations. The average time required for complete healing with suction drainage was 38 days. Omitting the two cases in which secondary operation was required, the average time of healing with ordinary drainage was 84 days.

The ages of the patients in each series are shown in the following table:

SUCTION DRAINAGE

Ages of patients	2	3	5	10	15	20	30	40 & over
Number of cases	4	2	5	3	2	3	2	3

ORDINARY DRAINAGE

Ages of patients	2	3	5	10	15	20	30	40 & over
Number of cases	0	3	6	3	1	3	3	5

During the period of time covered by this report there were admitted to the hospital four cases of pulmonary abscess communicating with a large bronchus on the one hand and a walled-off pleural abscess on the other. In these cases obviously the suction apparatus was useless,

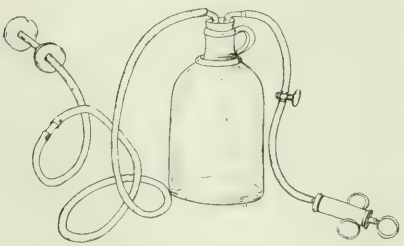
*Both cases of cerebral involvement were proved by operation and in one case an autopsy showed a hemorrhage about a thrombus at a distance from the abscess.

but the flanged drainage tube was of great value in providing a direct conduit for the pus between the chest cavity and a receptacle. This device avoided the soggy, ill-smelling dressings and the pus-bathed skin that go with the use of the ordinary drainage tube in such cases. The wound required dressing only at long intervals, a further comfort to the patients.

The suction apparatus used consists of a Brewer's flanged drainage tube[6] connected by a rubber tube to a 2,000 c. c. bottle, which in turn is similarly connected with a small hand exhaust pump. A stopcock or a pinch-cock is placed between the pump and the bottle. The rubber tubes connect with accurately-fitting metal ones which pass through the rubber stopper of the bottle. These joints are made air-tight by collodion or some similar material.

The operation as we perform it is carried out as follows: Under suitable anesthesia, usually local for adults and very young children, with nitrous-oxid-oxygen, or a small amount of ether added, for nervous adults and frightened children; about one inch of the rib is resected over the most dependent part of the cavity, usually the seventh rib, in the mid-axillary line. The opening here gives the best drainage in upright position, the one most often assumed by the patient for comfort in breathing. Moreover, suction applied from this point is not likely to be interfered with until the lung has expanded uniformly and extensively into the cavity.

Figure 5



The suction apparatus. Note the Brewer tube with sliding outer flange, the large bottle and the hand suction pump.

A needle is now introduced into the cavity through the space made by the removal of the rib and the pus drawn out by aspiration. During the time required for this procedure mattress sutures of catgut are put through the muscles on either side of the wound and left long and drawn aside to be tied later. Enough of these sutures are introduced to insure tight closure of the muscle layer. The aspiration having been completed, the needle is withdrawn and the pleura incised, the index finger of one hand follows the blade of the knife closely, filling in the opening as fast as it is made. The wound in the pleura is made just large enough to admit the index finger, which finger so plugs the opening as to prevent the passage of air into the cavity. The finger inside the pleura breaks through adhesions until the lung is felt expanding with inspiration.

The Brewer tube is now made ready for insertion by folding the inner flange into as small a compass as possible and fixing it in this shape in a clamp forcep. The outer sliding flange is well separated and the distal end of the tube closed by some sort of clamp. As the finger is withdrawn the tube is inserted and the forcep removed. The expanding flange is drawn against the parietal pleura and so closes the opening. The mattress sutures are drawn up and tied and the end of the tube is connected with the bottle from which the air has previously been exhausted. The skin is closed and the outer flange brought down tight over a single layer of four-ply gauze which covers the wound. Broad strips of adhesive plaster entirely cover in the flange and the dressing so that the contact between the outer flange and the skin is made air-tight. All this time traction must be made upon the tube in order to keep the inner flange in contact with the pleura.

The drainage tube is soft and any great exhaustion of the air in the bottle will cause collapse of its walls. This prevents too great suction being exerted. The glass connecting tubes permit easy investigation of the flow of pus.

The suction is continued for from two to four weeks. The average time is about 22 days. If the tube becomes clogged with fibrin the apparatus may be disconnected, the plugs removed and the suction again instituted. Irrigation of the cavity through the Brewer tube is easily done, the fluid

being removed by suction. This method of removing coagulated fibrin from the cavity, when this material interferes with drainage, is simple and in our experience is without danger, provided the fluid and air be promptly removed by the suction apparatus.

We have had no opportunity to use suction drainage in chronic empyema. Here a firm tube should be used in order that a suction force can be obtained sufficient to influence the contracted lung. This influence is compared by Perthes to that of extension of joint contractures. By drying the cavity and measuring the quantity of water required to fill it, and then applying sufficient suction to recover this quantity, we can be sure that the walls of the cavity have been collapsed. Repeating the experiment, the diminution in size may be followed and the progress of the improvement measured. It seems reasonable to conclude that the patient should be given the benefit of a course of this treatment before being subjected to serious or deforming operations for obliteration of the cavity.

CONCLUSIONS

To sum up, the advantages of suction drainage in acute empyema are:

1. The pus is carried directly from the chest cavity into a receptacle, thereby avoiding frequent change of dressings.

2. The expansion of the lung is accelerated as evidenced by the shorter period of convalescence, 38 days as against 84 with ordinary drainage.

3. Chronic empyema is avoided.

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114 *West Franklin Street.*

DISCUSSION

Dr. E. L. Gilcreest, Gainesville, Tex.—I first became interested in suction drainage in 1913, which year I spent in the clinic of Professor von Hacker, of Gratz, Austria. Schmerz, at this clinic, devised a special apparatus with a vacuum bottle as a receptacle. He cuts out a plug of tissue, resects a rib, cauterizes the pleura and inserts a rubber stopper just slightly larger than the plug which has been excised. The pus runs immediately into the bottle and the field of operation is not infected. Within a few days these patients are out on the veranda and in a short while are walking around with the vacuum bottle strapped to their sides. This is one of the most convenient receptacles that I have seen.

Dr. Floyd W. McRae, Atlanta, Ga.—I do no chest surgery, but I would like to show you a little device that I have used, and seen used, with much success. The device is known to us in Atlanta as the Ellis Gall-bladder Drainage Bag. It consists of a rubber drainage tube, a connection, over one end of which a drainage tube may be slipped, the other end slipped into the mouth of a rubber bag which holds eight ounces. In this connection there is a one-way valve that allows free drainage into the rubber bag, but will let neither air nor liquids pass back into the gall-bladder. At the other end of the bag there is a stop-cock which allows the bag to be emptied as often as required.

The device is useful in chest surgery, suprapubic cystotomies, etc. The dressings in gall-bladder cases may be kept as dry as any other clean wounds. The bed is never soiled, as the bile collects in the reservoir. It can not be turned over and spilled in the bed, and it does not hurt for the patient to lie on it.

Dr. J. Shelton Horsley, Richmond, Va.—I would like to mention a device that Dr. Ransohoff, of Cincinnati, recently spoke of as having used in drainage empyema. It is so simple and ingenious that I was struck with it. It consisted of a moderately stiff rubber tube, over the outer end of which was drawn a snugly fitting soft tube made of rubber-dam. The rubber-dam tube is so soft that while it will conduct off the drainage from the cavity of the empyema, it will collapse when air attempts to enter the cavity. In this way outward drainage is provided for, but inflow of air is prevented.

Dr. McGlannan (closing).—First, about the value of ambulatory methods in the treatment of acute empyemia. The common cause of acute empyemia is pneumonia. The patient requires rest in bed, and therefore does not require an ambulatory apparatus. For a long-standing, old case such apparatus would be of value except that it would not give sufficient suction to stretch the bound-down lung, but a patient with acute empyema needs to lie in bed.

Valvular drainage like Dr. Ellis' and syphon drainage have the same value, in that the expiratory effort of the lung forces air out of the chest and then no air can get back into the wound; but there is not sufficient active pull on the lungs to get great assistance to the expansion. And we need a rather active suction in order to be certain of the expansion of the lung.

One of the many advantages of Brewer's tube is that the flange rests flat against the pleura. It does not stick into the cavity and irritate the lung as the lung approaches the chest wall.

MECKEL'S DIVERTICULUM: WITH SPECIAL REFERENCE TO UMBILICAL DISORDERS OF INFANCY*

By R. M. Harbin, A.B., M.D., F.A.C.S., Rome, Ga.

The subject of this discussion will be found in a report of the three following cases coming under my observation:

Case 1.—N. W., age 12½ years, the seventh child, was, during infancy, very irritable, and when eleven days old the navel bled, after which a yellowish fluid persisted for four months. During the first few days of life he vomited a small quantity of blood. At the end of the fourth month there was a pedicle about half an inch long attached to the umbilicus. After several examinations I ligated this pedicle, which sloughed away. Until seven years old he cried often with pain in his stomach, especially from running, and pain would be intensified by pressure against the school desk. One month previous to the present illness he had pain with vomiting without any history of imprudent eating, but the attack passed off in twenty-four hours.

On Nov. 15, 1915, while in his father's grocery store, he ate two bananas, two sticks of candy and some walnuts. At 6 P. M. pain in his stomach became very pronounced; Epsom salts was given and repeated at 7 P. M. without effect. Paroxysmal pain, with vomiting, persisted through the night; enemata were given without effect. I saw him at 9 P. M.; pulse 90, temperature 99°, with slight tympany and pain around the navel. Next day symptoms were about the same, except more abdominal rigidity, with a leucocyte count of 13,800, red cells 4,900,000, and hemoglobin 75 %.

At 4 P. M. all symptoms were intensified and a probable diagnosis of appendicitis was made, and at 6 P. M. he was operated upon. After the usual gridiron incision there appeared a gush of bloody serum on opening the peritoneum. The appendix showed signs of a mild grade of inflammation, and was removed. The incision was enlarged and an investigation of other causes was made. The finger sweeping toward the middle line encountered a band extending from the umbilicus to a diverticulum attached to the periphery of a horseshoe loop of the distended ileum, 18 inches above the ileocecal valve. The loop of ileum was distended to four or five times its normal size and had a reddish black color. The mesenteric folds were adhered and contracted at the heels of this horseshoe-shaped ileum, and tugging on these adhesions produced an obstruction. There were ecchymotic spots in the mesentery and walls of the ileum. The tip of the diverticulum could not be pulled away from the umbilicus and was ligated, and the stump was infolded with Lembert suture. The incision was closed and his convalescence was uneventful and subsequent health greatly improved.

Case 2.—Feb. 9, 1916, I delivered, with forceps, a primipara of a male child, with the head in a persistent occiput posterior position. Six months later the child was brought to my office, having a strawberry excrescence about the size of a grain of corn on the left side of the navel. This excrescence made its appearance about six weeks previously, and various applications had been made without effect. A watery mucus exuded and a probe could be inserted into a pocket for about three-quarters of an inch. This mass was lifted up, ligated and cut away, and remains cured.

This specimen was sent for examination to Dr. A. H. Bunce, of Atlanta, Ga., and he reported that "intestinal mucosa is present in considerable quantity in the specimen of tissue and is undoubtedly a shut-off portion of the intestinal mucosa."

I advised the parents of this child that in the event of future obscure abdominal trouble the presence of a Meckel's diverticulum should be thought of.

Beginning three months ago, we have made a routine search for Meckel's diverticulum in the lower ileum in all cases submitted to elective abdominal operations, and so far we have discovered one case which may be of interest to report. But for this discovery, the cause of her digestion disorders would probably otherwise have failed to be removed.

Case 3.—Mrs. J. L., age 31, mother of seven children, the youngest being 2½ years old, entered the hospital for repair of a perineum and correction of a uterine displacement as the probable cause of digestive disturbances. She was the sixth in a family of eleven children. In questioning her mother only a negative history of umbilical disorder was obtained, but she referred to the patient as her crying baby, being more irritable than the other children. From infancy she has been constipated, and was continually prone to colic, even in the absence of imprudent eating. She complained often with stomach ache and had pain around the navel on running.

During the last few years she had been having a so-called "bilious attack" about every two or three months, with vomiting, etc., leaving "soreness in the right side as though from a kick," as she expressed it. She described a constant inability to expel gas, had had much straining at stool, and in this way had developed severe hemorrhoids. In her own words the stomach was never right, and was subject to dysenteric stools for a day or more every two or three weeks. She said she had passed small worms, but an examination of the feces revealed no ova of pasasites.

On Oct. 18, 1916, she was prepared for operation in the usual way. After curetting the uterus, amputating the os, repairing of the perineum and ligating the hemorrhoidal tumors, the abdomen

*Read in Section on Surgery, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

was opened. The abdominal viscera were thoroughly explored with the hand through the incision with negative result. The appendix showed little or no abnormality, but was removed. The round ligaments were looped and sutured to the under surface of fascia of the recti muscles. The lower ileum was then explored and a diverticulum was found about 1½ inches from the ileocecal valve, situated on the periphery of the gut, an inch long and about the size of a large thumb. Upward angulation had a valve-like effect, causing the ileum to balloon up, and then, after a certain amount of distension, rectify itself. This process in the course of time had caused a slight stenosis. The diverticulum was resected and treated in the usual way. From the clinical history it was evident that the diverticulum for several years had been the cause of increasing disturbance.

In this connection Dr. A. E. Hertzler, of Kansas City, Mo., in a personal communication, writes: "I recently saw a baby six months old with a patent duct, which everted as a strawberry-like mass from the umbilicus. It was removed and recovery was perfect. I did not remove the intra-abdominal portion and the patient still has the tube extending from the navel to the gut, a source of future trouble."

Balfour, of the Mayo Clinic, in a personal communication, says: "The only cases in which we have suspected Meckel's diverticulum, and have found one later at the operation, have been those in which there has been a history of discharge from the umbilicus." He has reported the following cases:[1]

"Case A-20,686.—Male, aged two years, consulted on account of a discharging navel, which condition had been present for over a year; no fecal matter, but occasionally quite severe bleeding; no other symptoms. The child was given an anesthetic and the umbilicus curetted and drained. The discharge persisted, however, and a few days later the abdomen was opened and a diverticulum found connecting the ileum and navel. The umbilicus and diverticulum were excised and the opening in the abdominal wall closed as in umbilical hernia."

In the same journal the author reviews 10,600 abdominal operations in the Mayo Clinic and found 15 cases of Meckel's diverticulum, but not in every operation was there made a careful search for this abnormality. Rarely a condition known as an umbilical anus persists where closure of the remains of the vitelline duct fails. But in some of these cases the sack may be closed over by the skin and present the appearance of an umbilical hernia, which in reality may be an imperforate umbilical anus causing obscure abdominal symptoms.

Aaron[2] has contributed an article on "Umbilical Dyspepsia," which he claims can be corrected by the proper application of adhesive plaster. Where the diverticulum is attached to the umbilicus we would expect more disturbance in the digestive tract.

According to Wellington,[3] in about a third of the cases the diverticulum is attached to the umbilicus. In his report there were 21 cases of persistent umbilical fistula, the lumen varying in size. Of these, 16 were operated upon with one death. In 27 cases a diverticulum formed a part of the contents in hernia, and typhoid perforation has been noted six times.

SUMMARY

Certain general conclusions may be summarized as follows:

1. Meckel's diverticulum, the incompletely atrophied remains of the vitelline duct, is found in 2 % of members of the human race, occupies usually the lower third of the ileum; occurs in males in the proportion of three to one of females; and is attached to other viscera in a third of the cases.

2. Clinical investigation should record the presence or absence of any history of polypoid growths, strawberry excrescences, hemorrhages, hernia, etc., about the umbilicus co-existing with diverticula which, before atrophy is complete, perhaps cause a large per cent. of the protean intestinal disorders of early childhood.

3. In view of the comparative frequency of this abnormality it is surprising that so few cases of acute diverticulitis arise. In the acute abdomen from this cause, the symptoms would be those of ileus modified somewhat. The signs of obstruction are not so rapid in development, and the symptoms of peritonitis are more gradual, such as less fever, less tympany and a less degree of leucocytosis. When the peritoneum is opened the presence of a bloody serum is suggestive. It may be remarked that the gross appearances of the appendix are not always reliable, even when actually the cause of the disturbance.

4. Chronic diverticulitis should be more

frequently investigated as an abdominal entity in the diagnosis of the cause of surgical indigestion, and from an anatomical standpoint it is surprising that such a large per cent. of Meckel's diverticula are symptomless. These overlooked diverticula perhaps explain a considerable percentage of unrelieved cases of surgical indigestion by operative treatment. The atypical nature of symptoms may be explained by certain anatomical variations of this abnormality, and are suggestive as compared with certain classical symptoms of dyspepsia due to other causes. These cases frequently are able to furnish a history of umbilical disorder in infancy and of having been irritable, colicky babies. Latterly there is a history of constipation, with the occasional presence of bloody mucus in the stool, causing straining. There usually has been pain around the navel aggravated by running or pressure from the outside, an inability to expel gas, bilious attacks without obvious cause, and the patient usually makes use of the expression that the stomach is never "right."

A complete review of the literature on Meckel's diverticulum may be found in Cullen's new book on "The Diseases of the Umbilicus."

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REPORT OF CASE OF FRACTURE OF THE PELVIS WITH EXHIBITION OF PATIENT*

By D. Z. Dunott, M.D.,
Chief Surgeon, Western Maryland Railway Company,
Baltimore, Md.

In presenting for your consideration and discussion a report of a case of fracture of the pelvis, and having vividly impressed upon my mind the conditions which lead up to this accident, the forces which were applied and the human failure which caused this, as it causes the majority of accidents, I cannot help being impressed with the unnecessary number of such injuries that disable our employees.

The interference with individual efficiency and wage days loss, through lack of appreciation of and indifference to, the great forces with which railroad men are of necessity constantly in contact, and the permanent mark of injury so many of our railroaders carry, is food well worthy of the thought of us all.

While probably the quotation, "Familiarity breeds contempt," was intended to apply originally to the relationship between individuals, it certainly is a most applicable expression to represent the feeling of the average railroad man toward the instruments which he uses daily in connection with his occupation and effort to earn his livelihood. My mind fails to grasp the mental capacity of a man in train service who lacks a full appreciation of his impotency in comparison to the weight and power of the integral parts of the train upon which he serves. While the human economy in fineness and technique is the supreme expression of mechanical superiority, its ability to oppose gross weight and mechanism is as futile as it is futile to attempt to stay the elements by human ingenuity. The result is inevitable and the human always suffers in the ultimate exchange of contact.

This being true, I can not see why every one connected with this character of work, fully aware of the power with which he deals; does not make every effort and at all times to avoid the possibility of injury. We know, however, they do not, and the failure is called the human equation. I do not wish to give you the idea that I am attempting a dissertation upon the subject of "safety first," for I have never been able to bring my own mind to the point of conceding that the propaganda of "safety first" is an effort which carries with it great merit. It seems to me that as the safety first idea is carried out, practically the entire scheme is one of making the machinery and tools with which men work "fool proof."

As stated above, the human equation is the responsible cause of the vast majority

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of accidents, — I believe about 80 %. Accepting this as true, I have always felt that the arguments were all in favor of the selection of men based upon physical fitness and mental appreciation of the character of work that they had to do rather than to expend our energies in making our machinery "fool proof" so that we might protect individuals who do not have the mental appreciation of their surroundings. This is a theory resulting from practical experience with injured employees. The answer from the average employing officer is, it is impossible because of the scarcity of labor.

Expressing the hope that I have your full pardon for the liberty I have taken in wandering somewhat from the particular topic at hand, I shall now return to the subject of my paper. As the character of the injury in this particular case presents unusual conditions, I believe that it justifies the consideration of at least some of the literature covering injuries to the pelvis.

Henrik Callisen, in 1778, described the post-mortem findings in a case of severe smashing injury to the pelvis. This reference will be found in Albert E. Halstead's report of "Central Dislocation of the Femur, with Fracture of the Acetabulum," in *The New York Medical Journal*, November 13, 1909.

Sir Astley Cooper, in 1812, gave an account of a case admitted to St. Thomas' Hospital which had the appearance of a dislocation backward of the head of the femur, the patient dying on the fourth day, post-mortem showing a fracture of the os innominatum, with a dislocation of the head of the femur into the pelvis.

Halstead states that since the first case was recorded up 'till 1909 about fifty cases in all of this character of fracture had been reported by various authors, calling attention to the most complete resume being published by Arregger in the *Deutsche Zietshrift für Chirurgie*, lxxi. Arregger collected from the literature 23 cases. Other contributions of note are by Wilms, Warner and Vacquez. The general experience, as the result of these 50 cases, indicates that a relatively small proportion are recognized during life and that the mortality associated with this character of injury is high.

Schroeder has reviewed the subject, collecting 46 cases from the literature and adding three of his own.

The records of the Cook County Hospital show an interesting case of W. McA., who entered March 18, 1909. I am taking the liberty of quoting this case as the details of it are complete:

W. McA., male, age 43, American. Entered Cook County Hospital on March 18, 1909.

HISTORY—About four hours before admission to the Hospital he fell down a flight of stairs when under the influence of liquor, striking on the right hip and right arm. After falling he attempted to arise, but could not on account of intense pain in the right hip. His right arm was also useless.

EXAMINATION at the Hospital showed he was still under the influence of alcohol. Pupils were equal and reacted normally to light. Right forearm was swollen and presented a typical deformity of Colles' fracture. The right leg could be moved, but with great difficulty, because of the excessive pain and rigidity and fixation of the muscles about the hip joint. The right trochanteric region was flattened, the foot slightly rotated inward and the leg adducted. Upon manipulation of the right lower extremity, the movements of the head of the femur were found limited in all directions, adductions and abductions being practically impossible; rotation to the slight degree was possible; the right trochanter swinging through a smaller arc than the left. There was great pain caused by pressure over the trochanter. On measuring from the anterior superior spine to the inner malleolus, the right leg was found ¾ of an inch shorter than the left. The right trochanter projected ½ inch above Nelaton's line. From the most prominent part of the right trochanter from the middle of the symphysis pubis, the right side was found to measure 6¼ inches; the left 6¾ inches. Rectal examination revealed the head of the right femur projecting through the acetabulum into the pelvis.

DIAGNOSIS—Fracture of the acetabulum with a central dislocation of the femur into the pelvis. Colles' fracture of the right forearm. X-ray proved the clinical findings correct.

TREATMENT—On April 5, under anesthesia, an attempt to reduce the dislocation was successful. The reduction was accomplished by manipulations similar to those employed in reducing a posterior dislocation of the head of the femur. Flexion of the leg upon the thigh, flexion of the thigh upon the abdomen, internal rotation and finally circumduction outward with extension. The head of the bone could easily be removed from the pelvis, as could be ascertained by diagnosital examination through the rectum, while the movements described were in progress. If released, it would return and present through the acetabulum. By maintaining extension and abduction, it could be held outside of the pelvis. In this position, under powerful extension, a plas-

ter cast was applied from the lower costal border to the toes on both sides. The legs were held in abduction by means of a brace, placed between the knees, which was included in the plaster cast. After two weeks the cast was removed from the uninjured leg.

On May 10 the entire cast was removed and massage of the injured side was begun. Passive and active movements of the hip were instituted a few days later.

On May 29 examination revealed the following: Right knee somewhat ankylosed from effects of plaster dressing. Right hip still showed some flattening over the trochanter. Movements in all directions could be made, but not to a normal degree. The thigh could be flexed to an angle of 60 degrees; outward rotation almost to the maximum was possible. Internal rotation very much hindered. Abduction limited. Abduction to about one-half the normal distance could be obtained.

Measurements from the anterior superior spine to the inner condyle of the femur were the same on both sides. Because of the flexion and slight ankylosis of the right knee, comparisons of the measurements over the anterior superior spines to the malleoli could not be made.

The distance from the trochanter to the middle of the symphysis pubis was slightly less (⅛ inch) on the right side than on the left. This could be accounted for by the atrophy of the muscles of this region.

The mechanism of fracture of this character you will find in Halstead's article mentioned above, so I shall not take up your time with this phase of the question except to state that from my investigation the mechanism by which these fractures are produced is not very staple. In some instances, indirect violence has produced the injury; in a number of cases the violence has been direct and apparently slight in comparison. Kronlein reports a case of a girl who fell a distance of 20 feet, striking upon her feet and causing both femoral heads to be driven through the acetabula. This case of Kronlein more nearly approaches the case that I have than any other case I have been able to find. Complications are the rule, hemorrhage probably being the most frequent. Graessner *(Deutsche Zeitshrift fur Chirurgie,* lxiv) reports from Bardenhauer's clinic a case of a window polisher who fell a distance of two metres, striking upon the hip. He was brought to the clinic in a collapsed condition with a rapidly forming hematoma in the region of the groin. He was operated upon when the external iliac vein was found torn, and bleeding was controlled, but the patient died shortly after operation was completed. Other soft parts, such as the bladder, the kidneys and the intestines may be injured with other comcomitant results.

Paul reports a series of fractures of the pelvis, with a history of 54 cases which were admitted to the State Hospital at Hazelton in a little less than ten years, or an average of over 5 cases per annum. Agnew, Vol. I, p. 962, states that 94 cases of pelvic fracture were admitted to the Pennsylvania Hospital during a period of 54 years. Paul works in a mining and railroad centre and you can readily appreciate why he would have a greater number of cases. In addition to this, we are diagnosing more of the fractures of the pelvis, because of the X-ray.

It might be pertinent to quote a case known in the literature as the Lendrick case:*

"In the example reported by Lendrick of Dublin, the patient was supposed to have a fracture of the neck of the femur.

"An old man while known as the 'Wandering Piper' was admitted into the Mercer Hospital in January, 1839, suffering with phthisis pneumonalis and acute inflammation of the hip joint. Some years before he had received a severe injury by the upsetting of a coach and was under treatment several months for what was supposed to be a fracture of the neck of the femur. Since that time he had been lame, but still was able to take a great deal of exercise on foot in Great Britain and in America. The acute disease of the joint commenced about two months before admission and he was at first under the care of Sir Philip Crampton, who remarked that the thigh was only short about ½ inch and expressed his surprise at this fact.

"This man died on the 17th of February and the dissection showed that there had been no fracture of the femur, but its head and neck were affected with morbus coxae seniles. The head was also thrust through a rent in the acetabulum into the cavity of the pelvis; but the head had again been recovered by a bony case, complete except in a small portion, about the size of a shilling piece and at this point the covering was ligamentous.

"The os pubis had also broken at the same time and it had united so much overlapped that the space between the inferior anterior spinous process and the symphysis pubis was shortened nearly an inch. A portion of intestine was found protruding through an opening in the pelvis and adherent to the bone, in which situation it seemed to have been caught by the broken fragments and retained."

*Quoted from Hamilton, "Fractures and Dislocations," third edition, 1866, p. 341.

Cotten reports a case occurring April, 1908, which is interesting because of the treatment and result and as a comparison.

"Fall from a second story balcony, April, 1908.

"Fracture left pelvis. Clinically, there was slight pain only, with extensive shortening and on lateral pressure on the trochanter a displacement of ½ to ¾ inch upward, with a distinct soft click. Professional diagnosis, fracture of rim of acetabulum. Very slight swelling and ecchymosis about the region of the femoral vessels.

"X-ray showed fracture of the pelvis just anterior to (possibly through) the acetabulum.

"As soon as this diagnosis was made and confirmed, the treatment was instituted of longitudinal traction with outward traction exerted by and around across the adductors to which a pulley weight was hitched. An X-ray plate of May 11 showed an entire disappearance of the deformity shown in the first plate. On examination, no click or mobility. The apparatus was removed at the end of four weeks.

"May 16, 1908, up in a chair.

"September, 1908, walking about with no limp or shortening or limitation of motion. Is at work. A perfect hip.

"January, 1909, is working as a teamster without any disability. All motions of the hip are normal."

AUTHOR'S CASE

The accident to brakeman A. W. Davis, whose case I am now reporting, occurred at 9 P. M. on March 8, 1916, at Hagerstown, Md. (yard). It might be interesting, in view of my opening remarks, to quote the report of the results of the investigation:

"Train 311, engine 620, pulled in on No. 42 track to the west end. Before the engine stopped at the west end, brakeman Davis got off the engine and changed the main track switch off the cross-over leading from No. 42 track to the westward main track. He then cut off the engine from the train and ran ahead of the engine and changed the switch at the west end of this cross-over just in front of the engine. It is shown by the engineman's statement that this switch was already set correctly, that the light shown white so long as engineman could see it, but Davis changed the switch just ahead of the engine and the engine ran through it without being noticed by Brakeman Davis. After the engine passed through, Davis again changed the switch back, thinking he was lining it up for the crossover. Instead, he changed it to No. 42 track. The fireman was not familiar with the position of the switch light and did not tell the engineman to go eastward until he was given a signal the second time to back.

"Davis, after changing the switch as he thought for the cross-over, started to walk eastward on No. 42 track, as the engine backed out of the cross-over to back in over No. 42 track; and before Davis knew it, the tank of the engine had knocked him down between the rails and the entire engine passed over him. No one on the engine was aware of the accident until they heard somebody call. The engine was not stopped until after the entire engine, as above stated, had passed over Davis. No wheels passed over any portion of Davis' body. He was simply rolled under the engine.

"The patient gives the following report of the manner in which the accident occurred:

"'9:00 P. M., March 8, after train 311, engine 620, had set train in west-bound yard, Hagerstown, I was riding with engine 620 to ash track through the main track switch, gave a back up signal on the fireman's side of the engine and started to walk across track in front of tank of engine as it approached me; was caught and thrown under the engine between the rails and rolled over the frog, cross over and switch point.'"

It is hardly necessary for me to call your attention to the fact that this injury was the result of man failure and not due to any deficiency in equipment or tools with which men were working.

The patient was in the local hospital at Hagerstown by 10 o'clock. He was first examined by Company Surgeons Wroth and Campbell, of Hagerstown, who were waiting for him at the hospital. He was perfectly conscious and suffered a great deal of pain. The following are Dr. Wroth's notes of the case while he was under his care:

"On being admitted to the hospital the pulse was above 100 with good quality. Skin rather cold. He had an extensive scalp wound of the occipital region and a slight one to the side. Apparently no fractures of the arms or legs, the chief injury received being in the neighborhood of the lower lumbar spine and the sacrum. In this region almost immediately was shown a large hematoma, extending clear across the back and down into the left buttock. He complained of the pain as being located in the region of both hips and in the back at about the level of the lower lumbar spine where they join the sacrum. The left foot was kept inverted slightly; the right foot was held in a normal position. Very slight motion in any direction could be made in either hip. Any motion beyond the slightest caused the patient to cry out with pain. There was a great deal of muscle spasm also, which prevented any motion's being made. There were a number of abrasions over both legs. None of them was serious. The patient was given a half a grain of morphia hypodermically, was made as comfortable as possible and was left with orders to have the morphia repeated if necessary.

"On the morning of March 9 an X-ray plate was made by Dr. Hoffmeier and this X-ray showed a fracture of the right side at the point where the ilium and ischium join with the pubic bone; in other words, immediately in the centre apparently of the acetabulum. The X-ray seemed to indicate that the head of the femur was pushed

inward toward the pelvis. The ilium seemed to be pushed upward away from the other bones which join it at the acetabulum. It was also separated from the sacrum on that side. On the left side the head and neck of the femur were uninjured, but there was a fracture at the acetabulum which was not so extensive as the fracture on the right side. After these X-rays were made the patient was replaced in bed. He had voided the night previous and the urine was smoky and under the microscope showed numerous red cells. The second voiding (300 c. c.) was nothing like so smoky as the first.

"The patient remained fairly comfortable during the day, receiving no morphia until the night of March 9, but having to be changed about in bed frequently and having to have the pads under the knees and ankles changed repeatedly.

"Dr. Dunott saw him on March 9 and remained over until this morning in order that another X-ray might be made. This morning after giving the patient a quarter of a grain of morphia, we took him to the X-ray room and made a plate with the fracture laid in as near normal position as possible and then a second X-ray with strong traction downward on each leg; an orderly holding the patient by the shoulders in order to prevent movement of the body as a whole. These X-rays simply verified the ones which were taken the night previously, nothing new being shown. The effect of traction on the position of the bone was nothing. The patient in bed last night showed an eversion of the right foot while the left foot was held in about the normal position. This morning he persistently, however, kept the right foot in a normal position and the left foot in marked inversion.

"Measurements were made as follows: Umb. to rt. int. mal., 89 cm.; umb. to lt. int. mal., 90.5 cm.; ant. sp. to rt. int. mal., 82 cm.; ant. sp. to lt. int. mal., 85.5 cm.; Bryant's line rt., 1.5 cm.; Bryant's line lt., 4.5 cm. These measurements showed that there was a difference of about three and a half centimeters in the Bryant's line, the one on the right being shorter than the one on the left. This measurement was confirmed by the measurements of the anterior superior spine, right and left. There is a real shortening on the right side and this is probably due to a dislocation upward which at the same time caused the fracture at the acetabulum and pushed upward to some extent the ilium. There also to my mind is a dislocation on the left side, backward and upward, though not so marked as the one on the right.

"As Dr. Dunott suggested, the patient is being made as comfortable as possible and he will probably, in the course of a few days, be removed to Baltimore."

March 11, 1916—The patient was sent to Baltimore this afternoon. The trip from the Hospital to the railroad station did not cause him any pain. He was sent down in the private car with a nurse in attendance to give him morphia if he had pain.

My association with this case developed on the day after the accident when I went from Baltimore to Hagerstown and examined the patient 24 hours after the accident had occurred. I found the left leg immobile at the hip with a decided inward rotation of the thigh, leg and foot. Right leg shorter than the left by at least 2 cm. Foot rotated outward and apparently a difference in the length of the thigh as measured from the symphysis to the knee, the right thigh being the shorter. Examination of pictures, which had already been taken, was difficult, as the plates were pale. But it apparently was evident from the first picture taken that there was considerable damage of an unusual character to the pelvic bones; and on account of this condition I deemed it advisable to make arrangements to have Davis transferred to Baltimore as early as I thought was consistent with safety. Therefore he was moved to the Church Home and Infirmary in Baltimore on March 11. He stood the trip well, rode comfortably and showed no evidence of shock. On arrival he was placed in bed.

A large hematoma had developed in the region of the ilium, extending down into the gluteal region, both sides and across the back.

On being admitted to the Church Home and Infirmary the temperature was 99.5°; pulse 95. The temperature did not reach normal until March 17. Maximum pulse was 115 between the entrance to hospital and March 17. Respirations were normal. From that time on, after recovering from the anesthetic, which was given on March 17, there is nothing of interest in his temperature chart, as the pulse, temperature and respirations were normal. No evidence of blood in the urine; no internal complications.

On the morning of the 17th the patient was anesthetized, placed on a Hawley table and pictures were taken of both hip joints. The reading of original plate taken in Hagerstown confirmed and showing further considerable separation of the ilium from the pubis and ischium; also a separation of the symphysis. Right hip showed a very wide space existing between the ilium and the other two bones of the pelvis on that side, with the femur having been driven through the acetabulum upward and behind the ilium, making an extremely wide separation of the pelvic bones at this point. Reduction was attempted of left leg (after gentle movement, flexion, rotation, etc., to free the bone as much as possible). The leg was bent on the thigh; the thigh was bent on the abdomen forcibly; the knee was shoved toward the median line; the knee was then brought out toward the axillary line in a wide arc; then the leg was gradually extended and brought down to a normal position, the bone slipping into the acetabulum, completing the reduction. The apparent increase in the length of the left leg after reduction was about three inches. A picture was then taken and developed immediately, showing that the head of the femur had engaged itself in the acetabulum.

The right leg was then manipulated in the reverse manner, the effort being to engage the head of the femur against the lower edge of the ilium so that the ilium could be used as a fulcrum to lift the head of the bone out of its abnormal position. The leg was flexed upon the

thigh, the thigh flexed to a right angle, the knee rotated outward forcibly and the leg strongly abducted, the thigh then forcibly flexed, with Dr. Bennett using all the force at his command, pressing upon the lower edge of the ilium, my idea being that if I could engage the head of the femur against the lower edge of the ilium that by bringing the knee in a wide arc toward the median line by adduction that I would force the ilium back toward the pelvic cavity, holding the head of the femur to the outside of the ilium as I gradually brought the leg down along the median line through the adduction arc to its normal position alongside its fellow.

The mechanism, as you will see by the pictures, was correct and the bone rested to the outside of the pelvis instead of through the acetabulum. It was with considerable difficulty, however, that this position was maintained pending the time the foot was strapped to the stirrup of the Hawley table and the extension applied. It might be well at this time to call your attention to the fact that the series of pictures being shown was taken as the various steps were made by me and immediately developed so that we could see just what was being done from time to time.

After reductions of both legs had been made, the extension applied to both legs, that of the right, of course, being very much more severe than that of the left and a picture taken which indicated we had gotten about as near a normal position as we thought could be obtained, the right leg was then widely abducted for two reasons: first, for sanitary purposes; secondly, because I felt that it would have a tendency to force the ilium toward the inner line of the pelvic cavity and bring it in closer coaptation with the other fractured ends of the pelvic bone of the right side.

A very heavy plaster cast was then applied, extending from the arm-pits to the toes and allowed to harden in this position before traction was relieved. As soon as the cast had set, the traction was relieved and screen plates were taken, which you will note show the position of the two femurs in relation to the acetabula. The patient was then put to bed, but complained of some discomfort for the next forty-eight hours, not very severe, except over the heels. Gradually he became more comfortable as the days passed; all functions were working; there was no elevation of temperature and pulse was normal.

In describing the injury, I forgot to call your attention to the sacro-iliac separation of the right side. About a week after the cast was applied the patient complained of inability to extend his toes of the right foot. I had not noticed any paralysis prior to the application of the cast, no evidence of foot drop, and I came to the conclusion possibly the paralysis was the result of pressure used in the extension. About the twelfth day after the cast had been applied, there was considerable improvement made in the ability to extend the toes.

The day following the application of the cast, the toes which were free, of both feet, appeared very white. The hands also were white, but not so white as the toes. I feared possibly some constriction. However, hemoglobin test which was made showed only 60 % and I felt that this would account for paleness. Subsequent developments proved this to be correct. The man had lost a large amount of blood as a result of his scalp wound and the hematoma above referred to.

The measurements are interesting as made at the time of the reduction. Before any reduction of either leg was attempted, measurement from the spinous processes of the ilium to the inner malleoli of both legs showed a difference of ½ inch between the left and right leg, the right leg being the shorter of the two. After the reduction of the left leg and before the reduction of the right, there was a difference of 3½ inches. After reduction of the right leg, as stated, there was only ½ inch difference and at the time I accounted for this difference by the fact that we had a sacro-iliac separation. On account of the displacement of land marks my measurements can not be considered as absolute, although the measurements from the spines of the iliac crests checked up correctly with the measurements from the umbilicus to the inner malleoli.

During the entire time the cast was worn the patient's appetite was good; his spirits were good; he slept well; and his functions were normal.

The following is the report of Dr. Bennett, who took the X-ray pictures at the time of the reduction:

1275—Post-operative reduction, left hip. Head of femur in acetabulum. Result splendid.

1276—Right hip. Head of femur in position on Hawley's table, without traction; position of pelvic bones not so good.

1277—Right hip after reduction. Patient on Hawley's table; slight traction applied. Position good.

It will be interesting to note the effect of traction in connection with the reduction particularly of the right hip. In making the reduction of the right hip, it was found that unless firm pressure was made by an assistant over the head of the femur shoving it downward, the head would immediately fall back through the opening of the acetabulum.

In my judgment, the reduction and maintaining of good position could not have been accomplished in this case without the use of a Hawley or one of the other mechanical tables, which have been devised for cases in which plaster casts are to be applied. My personal experience has been confined to the Hawley table and it fully fulfilled the requirements in this case.

The entire operation, including the development of plates, required about one hour and forty-five minutes. The patient was put back to bed; recovered well from ether; suffered some discomfort and pain, of course; and required for the first ten days anodynes. The maximum dose of morphia in any twenty-four-hour period was ¼ grain, with exception of one night, when he had ½ grain. At the end of two weeks pictures were taken, which are shown, and you will note no indication at this time of any callus formation. At the end of the thirty-third day after the cast

was applied, pictures were again taken, and the cast was removed on the thirty-fourth day. Massage was used freely with gentle flexion of the thighs, passive motion of the other joints, and ten days later, or on the forty-fourth day, he got up in a wheel chair, and on the fifty-first day was allowed crutches, carrying most of his weight in the beginning upon the left leg. He was discharged from the Hospital on the sixty-third day.

The motion of both hip joints improved daily; the patient suffered some but not much pain; he was able to sit in the chair comfortably, and carried his weight with comparatively little discomfort while on the crutches. Before leaving the Hospital, he was able to walk without the crutches by simply placing his hand on my shoulder or the shoulder of an attendant and walked with very little limp and practically no swinging of the body. He was sent to his home in Hagerstown and I am unable to give you the date upon which the crutches were discarded. But as he gradually moved about depending less upon his crutches, he showed a tendency to increase in limp and some shortening of the right leg. My first thought was that the laceration of soft parts and damage to muscle tissue of the right gluteal region was responsible for the peculiar gait, and with this in view for the last three months he has been receiving active massage over the right hip, which has materially improved his condition.

You will also note from examination of the patient that he is wearing a brace, on his left foot to overcome the toe drop mentioned in the beginning of the paper, and he is also wearing a shoe with an inner sole built up ¾ of an inch and a heel built up to about two inches to accommodate or replace the shortening which is gradually taking place.

A final picture was taken of the right hip on August 25, 1916, and the report of Dr. Bennett is given below:

The man at this time is active, moves with comfort, apparently has no joint pains, except in his right knee, which is not severe. With a cane he walks fairly well. Without a cane he has a very decided limp with a side twist to his body which is very perceptible. Flexion and adduction of both thighs are limited, very marked in the right, but Davis is able to sit down upon a chair comfortably and is also able to dress himself, lace up his shoes, etc.

While I may be open to criticism for the removal of the cast at the early period mentioned, my reasons for taking this action were as follows: I wished to avoid, if possible, the great pain and discomfort so frequently produced by irregularities in joint surfaces and I felt that while I was taking a chance to take the patient out of plaster in five weeks, the possibility of the femur's wearing down and smoothing off the irregularities which were bound to be produced by the formation of callus as the fractures of the acetabula united were much more apt to occur if this could be accomplished while the callus was still soft, and that if it could be accomplished by this mechanical procedure, the possibility of eliminating pain would be much greater. Secondly, I felt if the patient were kept in the cast too long and the callus were not worn away by the motion of the joint, that the chances were largely in favor of the growing callus' gradually pushing out and displacing the hip bones from their normal position in the acetabula.

I had no particular precedent to guide me in these thoughts and I felt that my reasons were sufficiently sound to justify the early action that I took in taking away the plaster dressings. These same reasons governed me in having him use his limbs as freely as possible in bed for the next ten days and also in getting him up and on crutches and urging him to put weight upon his limbs. I am not sure in my own mind, in view of the last picture which I have presented of the right hip, that my theory was entirely justified. The X-ray report August 25, 1916, shows a luxation of the right hip due, in his opinion, to the pushing out of the head of the femur by the callus formation. This diagnosis being correct, my early action in this case with reference to removal of cast, etc., did not accomplish the result of wearing away of the callus and retaining the acetabular cavity. While I have no picture of the left hip (failure to take one being purely an oversight), from the general motion of the hip and the manner in which he uses his left leg, I feel quite confident its position is practically normal. Therefore, it is possible that the early action above referred to may have had considerable bearing upon the ultimate result which I have obtained with the left leg. Certainly, he has no painful hip on his left side, although the literature would lead one to expect him to have a great deal of discomfort. His right hip is still a cause for thought and probably action.

Bearing in mind the fact that he is a man who has to labor and that in his present condition he is unable to follow the occupation that he engaged in before he was injured, that his present education does not permit him to earn wage in any

other class of service comparable to the wage he was earning and would have continued to earn as a trainman, the advisability of considering further surgical interference, with a hope of being able to ream out the pelvic cavity, replace the bone in its normal socket and obtain a normal or more nearly normal hip, is one which naturally presents itself with considerable force. On the other hand, he is able to move around with comfort, to walk considerable distances without pain, is able to undertake some class of work, is mentally sufficiently equipped with ground work to justify the anticipation of his being able to educate himself for work in another class of service whereby his earning capacity might at least be brought up to the standard of his former occupation and with the possibility (provided the ambition and steadfastness of purpose will come to him) that he may go far beyond, both in earning capacity and position, the point he had reached on March 8 when the accident occurred. Considering his future from the two points of view above quoted, with the view of giving professional advice as to the course he should pursue, remembering in the first instance the possibility of failure of bettering a condition which in my judgment is fairly good under all the circumstances, and on the other hand realizing the depression, sense of restraint and personal mortification that comes to any man who is physically handicapped, either by deformity or by disease, particularly so when such deformity or disease comes after he has known many years of normal physical capacity, places upon me a responsibility regarding the advice I should give him which I hesitate to assume. If I accept the hypothesis that this patient would have continued to be entirely satisfied with his position in train service and accepting his promotion simply because of his seniority rights and that he does not possess either the desire or the capacity to equip himself for better work in the future in other lines of service, I would be inclined to advise him to submit to further surgical procedure and take his chances. But knowing the man, I am not willing at this time to accept such a hypothesis. I believe he is capable and his misfortune may be his spur. Consequently, I hesitate.

In conclusion, it is interesting to note that while the literature indicates that the mortality is high in this class of fractures, that he escaped serious injury to any vital structures and at no time after the first twenty-four hours gave me any concern from a mortality standpoint, except that I realized that it was possible at the time reductions were made that I, myself, might do serious damage to soft parts and surrounding structures in my effort to bring about a normal relationship of the bones of the pelvis.

I have given you as fully as possible the history and resume of the literature of fracture of the pelvis in which the femur or femurs have been driven into the pelvic cavity, so that I could ask you not only freely to discuss the character of injury and the method of treatment from all angles, but also that you might be in a position to help me in the decision which I will have to make. I would further ask you to give consideration to the views I have expressed in the first part of my paper in connection with the man failure or human equation, feeling that if the views of a body of men as representative as this body is recognized to be, could, without prejudice, coincide with the views that I hold on this subject, the weight of opinion expressed by you would bear heavily upon the arguments in opposition. While the number of men who think is large, and while the number of men thinking create by their thoughts ideas and methods that are of great value, there are comparatively few men who take the time or trouble or who have the ability to corral and publish their thoughts and methods, and, therefore, generous discussion, whether it be of professional matters or whether it be of public matters, is of the utmost value. For this reason I request of you the freest possible discussion, asking each one of you to express your thoughts frankly and without hesitation, assuring you that I will appreciate whatever you have to say, whether it be in the line of commendation or in line of criticism.

It has only been lately that I have had the honor of being enrolled as a member of this Association, and if I have taken advantage of my first opportunity of ad-

dressing you of presenting to you a case the details of which have been too long and the manner of presenting uninteresting, I ask your pardon and I shall submit as gracefully as possible to any judgment that may be rendered against me.

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Editor's Note: This is the second of six papers on fractures read before the Railway Surgeons. The first one appeared in the January issue, the other four, with discussions of all, will appear in future issues.

GYNECOLOGICAL CLINIC*

By John Wesley Long, M.D.,
Greensboro, N. C.

CASE I.—RETROVERSION, CHRONIC APPENDICITIS, SHIRRING THE ROUND LIGAMENTS, AND APPENDECTOMY

The first patient operated upon had retroversion and chronic appendicitis. She was a young white woman, age 29, married, and had borne one child. This case was a beautiful one upon which to demonstrate the best method of shortening the round ligaments.

Attention was called to the story of Alquie, of Montpelier, who in 1840 proposed to the French Academy of Medicine to shorten the round ligaments by drawing them out of the inguinal canal. The Academy appointed a committee which, after four years, reported adversely and congratulated Alquie for not having tried his operation upon the living woman. He had performed it upon dead subjects and animals. In 1881, Alexander successfully did what Alquie proposed. In 1886, Wiley, who was Dr. Long's teacher, shortened the round ligaments intra-abdominally by folding them upon themselves. In 1897, Goldspon did practically the Alexander-Alquie operation modified by opening the peritoneum sufficiently to introduce the forefinger. It is recalled how he cut off the forefinger of his glove. Nineteen hundred marked a decided advance when Gilliam pulled the ligament through the fascia and rectus of the abdominal wall. The next year Webster pulled the

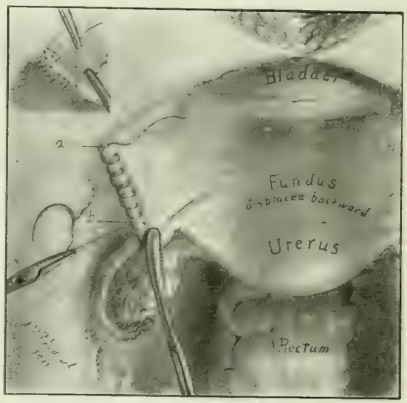


Fig. I.
Shirring the Round Ligaments.

round ligaments through the broad ligaments and sutured them to the uterus behind. From these groups many modifications have arisen.

Dr. Long demonstrated his method of "shirring the round ligaments." The plan is both simple and effective. A glance at the illustrations makes the operation clear. After opening the abdomen, the ligament is pulled out of the inguinal canal as far as possible and a needle thrust through it close to the internal ring. This is repeated several times, always traveling toward the fundus.

*Before the Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Tuesday, November 14, 1916, at the Grady Hospital.

The ends of this continuous suture are tied together, which shirrs (shortens) the ligament. The fold of peritoneum springing from the pelvic wall is stitched over the shirred portion of the ligament. Dr. Long stated that the entire operation is free from trauma, is correct in surgical principles and certainly is as effective as any other operation for shortening the round ligaments. He further added that the method had been adopted in the Mayo Clinic and by a number of other surgeons.

CASE II.—INTERSTITIAL UTERINE FIBROIDS. SUBTOTAL HYSTERECTOMY.

The patient was a nulliparous Negress, 36 years old. She evidently had had pel-

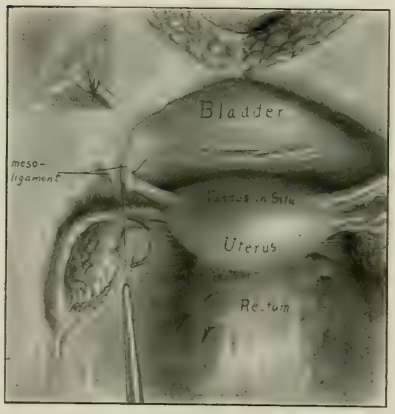


Fig. II.
Shirred Portion of Ligaments Covered with Meso-Ligament

vic inflammation a long while ago, since there were many well-organized adhesions and the uterine mass was firmly fixed *in situ* so that it would not be delivered or elevated the least degree. The immobility was augmented by some of the fibroids' being situated low and developing deeply into the broad ligaments. The only practical way to remove the mass was to bisect after the manner of Kelly and deliver it piecemeal. This was done without so much as disturbing the adhesions. The visitors were asked to note the absence of any degree of trauma or even congestion of the intestines.

CASE III.—PYOSALPINGITIS—BILATERAL SALPINGECTOMY

"Perhaps the most common abdominal condition found among 'the daughters of Ham' is pus tubes." This patient, a colored woman of twenty-nine years, had enormous tubes. One contained a pint or more of pus. Dr. Long stressed the inadvisability of operating upon patients with pus tubes during the acute stage of the disease. Simpson has shown that the temperature should have been normal for several weeks before operation. By this time the pus is sterile and the toxins are neutralized. This is the most important lesson we have learned concerning pus tubes since Neisser discovered their cause.

In this instance the huge tubes were gently enucleated. Pus was spilled in the pelvis, since part of the largest abscess was outside the tube, extending deeply into the cul-de-sac. A supra-public drainage tube was used.

A report from Dr. E. C. Davis three weeks after the clinic was held says all the patients made uninterrupted recoveries.

REPORT OF A CASE OF SUPERFETATION OCCURRING IN A UTERUS SUBSEPTUS

By W. T. Pride, M.D.,
Memphis, Tenn.

Mrs. N., aged 28, mother of one child, sent for me in September, 1915. She was found with a temperature of 101° F., pulse 110, a very foul discharge coming from the vagina, with a history of having had an "abortion" performed about one week earlier. Examination showed a partial discharge of retained secundines—the uterus about the size of a four months' pregnancy. She stated she had had a chill that morning.

She was sent to the ward of the Lucy Brinkly Hospital and that afternoon the uterus was emptied. Upon exposing the cervix two ora uteri were observed with a discharge from both. Upon the right side the curette could be introduced for about five inches. Upon the left side some dilatation was necessary, whereupon the curette was introduced about three and one-half inches. There was no communication between the two, a thick septum intervening all the way to the fundus.

Upon the right side the well-formed placenta and portions of retained membranes were removed. Upon the left, the formation of the placenta was incomplete, but a decided quantity was removed. Iodoform gauze was introduced into both sides and the nurse was given instructions to remove it the next morning.

The patient made an uneventful recovery, leaving the hospital after ten days. One week later she called at my office, stating her "womb was down." Upon examination I found what she had felt to be the iodoform gauze in the left side, the nurse having removed only that in the right side. There was no further trouble.

This case is reported because of its rarity and because its existence is really doubted by many authors. It may be that in the above case the smaller left side was not a later pregnancy than the right, but certainly the placenta and membranes are very conclusive.

I regretted very much not being able to see the fetuses which the abortionist had removed. The uterus subseptus is a rare condition and it is not unlikely that it may lead to more multiple pregnancies.

Memphis Trust Building.

AUTHORS' ABSTRACTS

Surgery, Gynecology, Obstetrics and Genito-Urinary Diseases

Gonorrhea in Women. John E. Hall, Nashville, Tenn., Journal of the Tennessee State Medical Association, January, 1917, p. 358.

The writer believes woman's ignorance of gonorrhea and the mildness of symptoms, responsible for the laxity of the profession in not making a thorough examination when consulted as to the cause of her leucorrhea. Diagnosis is usually made by guess rather than by scientific methods. The author calls attention to the necessity of microscopical examination of the secretions. In married women, the possibility of leucorrhea's being gonococcal in origin is often overlooked notwithstanding the fact that most husbands have had gonorrhea and the majority are still infectious. Gonorrhea is increasing in prevalence, and will continue to do so until the profession realizes its importance as a cause of pelvic inflammation, sterility and semi-invalidism. He stresses the importance of correct early diagnosis, followed by intelligent treatment, as the disease is beyond cure after involvement of pelvic organs takes place. Chronic cervicitis and Bartholinitis are sources of gonococcal infection from which men contract gonorrhea from women who show no external evidences of the disease. In treating cervicitis, most recent authorities state that cauterization by solutions of iodin and nitrate of silver does no good, as it does not penetrate deeply enough into connective and muscular tissues to effect the organism. In endometritis curettage is worse than useless, as it is impossible to remove the infected endometrium and its glands, and it may do harm by causing acute salpingitis. Vaccine treatment as used at present is as likely to do harm as good, as this form of treatment is not yet established upon a scientific basis.

Blood Transfusion Simplified; Deductions from Nineteen Cases, Eleven Human and Eight on the Dog. J. T. Nix, Jr., New Orleans, La., New Orleans Medical and Surgical Journal, December, 1916, p. 435.

An apparatus was devised consisting of two extra large glass syringes (200 c. c.), one of which was to contain sodium citrate solution and the other to aspirate or inject blood. The blood syringe was connected by a short rubber tubing to the shaft of a Y-tube. One arm of the Y-tube was connected with a special glass transfusion tip which was inserted and tied in the vein of the recipient. The other arm of the Y-tube was connected with one arm of a T-tube. The shaft of the T-tube was connected with the citrate syringe, and the distal arm of the T-tube was connected with another transfusion tip which was inserted and tied in the vein of the donor.

The donor's blood is mixed with citrate as it is extracted and the tubes and connections are constantly kept bathed with citrate from the syringe. The apparatus is supported on a metal frame, all of which can be boiled.

When disconnected, single transfusion can be done with either syringe and the separate transfusion tips.

The apparatus is very simple. Transfusion tips are made from drinking tubes by simply heating with an alcohol lamp and drawing out to a point. Any style syringe is applicable,—glass, asbestos-glass, hard rubber or metal,—the larger the better.

The paraffin coating of the tubes, spraying of the tips with ether and other complicated measures are eliminated, and the current of blood is changed to the desired direction by simply applying small forceps to the rubber connection.

The Non-Protein Nitrogen and Urea in the Maternal and the Fetal Blood at the Time of Birth. J. Morris Slemons and William H. Morriss, Yale Medical School, New Haven, Conn. Bulletin of the Johns Hopkins Hospital, December, 1916, p. 343.

Great difficulties attend the study of the nutrition of the fetus in utero, consequently little is known of the mechanism of the placental interchange. With improved methods for blood-analysis investigation of this problem becomes possible by comparing the composition of maternal and fetal blood at the moment of birth.

Normally, identical quantities of urea are found in both circulations which indicates that this, the chief fetal nitrogenous waste product, passes through the placenta by diffusion. In other words the fetal urea enters the mother's blood in the same way that urea from her own tissues enters it.

(Continued on page 173)

EYE, EAR, NOSE AND THROAT

THE OPERATIVE TREATMENT OF CHRONIC FRONTAL SINUSITIS*

By T. W. Moore, M.D.,
Huntington, West Va.

The operative treatment of chronic frontal sinusitis resolves itself into the establishment of free discharge or the obliteration of the sinus. The former is preferred by a large majority of the rhinologists today, owing to the deformity so frequently resulting from attempts to obliterate the sinus and by the more favorable results obtained by free drainage.

The principal causes of obstruction to drainage are deviations of the septum or hypertrophies of the middle turbinates and adjacent structures and polypoid or other pathological changes in the mucous membrane about the sinus or in the naso-frontal duct.

It is surprising how often chronic sinusitis not only of the frontal, but also of other sinuses clears up and the symptoms subside after straightening a deviated septum by a submucous operation.

There must be an X-ray picture taken in all cases as a diagnostic measure, and to make sure that there is a frontal sinusitis. Then the anterior end of the middle turbinate should be removed and the neighboring ethmoid cells broken down, as this may bring about a cure. If it does not, it will lessen the hemorrhage at the time of doing a more radical operation.

During the last two years there have been some advances in the treatment of this condition, and I particularly wish to talk to you today about the advantages of the operation devised and perfected by Dr. Howard A. Lothrop. As a preliminary step, Lothrop places a pledget of cotton saturated with a 4 % cocaine and epinephrin solution above and where the anterior end of the middle turbinate has been removed, just before beginning the anesthetic. This is removed after the patient is anesthetized. This lessens the bleeding. The posterior nares are plugged before beginning the operation, thus preventing the blood from entering the larynx.

The technique is comparatively simple; there is no scar and very little after-treatment. In the cases that I have treated by this method the results have been most gratifying. The incision is made in the eyebrow, which is not shaved but prepared by scrubbing with green soap and alcohol. It is about one inch long and extends from the supraorbtol notch inward on to the nose. After the bleeding is controlled the periosteum is cut and elevated, the wound being held open by a Vail's or Jansen's retractor. An opening is chiseled into the bone at the naso-orbital angle or Ewing's point. For this I use a large Alexander's mastoid chisel. After the opening is made into the sinus, it is enlarged with a rongeur forceps, Lothrop says to ¾ inch. I have not found it necessary to make the opening so large. The sinus is then curetted if any polyps or granulations are present, preserving so far as possible the mucous membrane intact. A probe is then inserted through the ostium into the nose. The fronto-nasal duct is enlarged with a small curette or rasp until the spine of bone is reached, using the probe as a guide. This is then rasped off, or taken off, with burrs until the entire nasal floor is removed.

The partition between the sinuses is burred down and removed in all cases, at the same time removing enough of the perpendicular plate of the ethmoid to give free access to the now one sinus through either nostril. The wound is now closed with no packing, and a pressure bandage is applied.

I have only performed this operation five times, and will give you a brief analysis of my cases:

Case I.—The patient had been operated upon two years previously intranasally, without any benefit. The Lothrop operation was done very thoroughly. The next day the dressing was removed and the patient was resting comfortably. The following day he returned to his home, where the stitches were removed on the seventh day. There was no other treatment, not even a nasal douche being

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

used. So far, after six months, I am informed that there has been no return of the symptoms and the patient thinks that he is cured.

Case II.—This patient had been operated upon by me intranasally for a purulent left frontal sinusitis about two years previously. He had been apparently well after about six months of irregular treatment. He came stating that about three weeks before that the same symptoms had developed upon the right side, and that he had been unconscious for nearly three days during the second week; and whilst he was much better, he was having much pain and frontal heaviness, especially after stooping. I did the Lothrop operation, following as closely as possible the technique described by the originator. As there had been no previous intranasal operation upon this side, I removed the anterior end of the middle turbinate as the first step after the patient was anesthetized. The septum between the sinuses was so far to the right that I entered the left sinus and thought that I had found a large sinus with no partition; but in searching for the ostium I readily broke through, entering a small sinus filled with pus. I proceeded to remove the intranasal floor completely. The patient felt splendidly the next day when the bandage and outer dressing were removed and a dressing of cotton and collodion was applied. He went to his home twenty miles away the following day, returning to my office the seventh day to have the stitches removed. I saw him again on the twentieth day and also two months later. This patient used a weak iodine in oil spray at home, but had no other treatment.

Case III.—This man had been operated upon intranasally by me in 1913. His pain and the secretion stopped for about six months, when, after an attack of influenza, a severe frontal sinusitis occurred, with all the classical symptoms. He was treated until July of that year, when he came to me stating that he wished an operation that would cure him. The Lothrop operation was performed in July. At the time of the operation there was very severe bleeding, which was not entirely controlled until after the operation was finished and the patient had been sent to his room. The hemorrhage seemed to come from the upper portion of the nasal septum and prevented me from removing as much of the perpendicular plate and not quite so much of the spines of the frontal bone as desired. This patient had a stitch abscess with swelling of the eyelids, the eye upon the operated side being closed. This yielded slowly to treatment. The nasal opening was not so large as it should have been. Three times since the operation was performed the patient has developed some headache and a slight purulent discharge in the nose, which subsides when the opening is enlarged through the nose. This I have done with the rasps.

Case IV.—An out-of-town patient who had had chronic frontal sinusitis for two years left the hospital the day after the operation in company with his family physician and has not been heard of since; although I am confident that he would have returned had there been any untoward symptoms.

Case V.—This patient had been operated upon almost a year before externally, and had been relieved until a few weeks before I saw him, when his old headache returned more severely than ever. I found no pus in the sinuses, although there was some granulation tissue and some polyp-like masses. The nasal floor of the sinus was removed thoroughly. The patient developed a stitch abscess on the fourth day, from which there was some purulent discharge for about ten days. This patient still has slight headache and some crusts in the nostrils, although his other symptoms seem to have subsided.

CONCLUSIONS

1. I believe that in the Lothrop operation we have all the advantages of the various intranasal operations, with practically none of their dangers, because we are able to see each step of the work. In addition, none of the intranasal methods removes the floor of both sinuses so completely as this.
2. The technique is simple and the operation is easily performed.
3. The cosmetic effect is excellent, there being practically no scarring.
4. The very little after-treatment makes it particularly applicable to those patients who are so situated that they can not undergo prolonged after-treatment in skilled hands.
5. The results are very satisfactory. The symptoms, especially pain and increased secretion, disappear.

DISCUSSION

Dr. T. W. Moore—I wish to say that I saw this operation done by Drs. Richards and Lynch in New Orleans last March. At that time they had made some rasps. They were unable to obtain those Lothrop used. This rasp (exhibiting), which is theirs, has a handle which was added by me so that it can be better controlled. They also devised these two burrs (indicating) which are plane on one surface to prevent their going through the cribriform plate. In the last operation I used the Tilley burr, which was devised, as you know, for use in the maxillary antrum. Of course it cuts in all directions, but, seeing the field as you do, I do not think it is necessary to have protected burrs as it would be if we could not see what we are doing.

This (indicating) is Lothrop's burr, which I received just a few weeks ago and which I have used in only one operation.

This rasp (indicating) I have used several times. Dr. Lynch will explain more in detail.

Dr. R. C. Lynch, New Orleans, La.—As you know, the operation for the cure of chronic frontal

sinusitis has been somewhat of a disappointment to most of us. Those who have been through the disheartening experience of the Killian operation, with the deformities, and of this sinus operation designed primarily to get rid of the infection without deformity, have been to me personally and to others of my friends with whom I discussed the question unsatisfactory, until Lothrop presented to us at the meeting of the American Medical Association on the Pacific Coast his operation upon the frontal sinus. It seems to me, since I have been doing it, that the operation meets all the demands that we put upon it for the cure of chronic frontal sinusitis without any of the deformity and gives one possibly the greatest opening from the frontal sinus into the nose. In many of the chronic cases of frontal sinusitis we find both sinuses involved, especially where one examines the inter-sinus septum.

In two of my cases where only one frontal sinus was involved, opening up the sinus of the non-diseased side had no influence at all upon the cure of the condition. In other words, opening up the normal sinus did not seem to diminish the resistance of that sinus, and it was not infected as the result of communication with the diseased side, which I think is an important observation. Certainly the operation is attended with practically no deformity and I have been able to secure the photographs of three of my cases which will speak for themselves.

The first one that I show, that of a lady who had been operated upon by my predecessor, Dr. Gordon King, some fourteen or fifteen years ago for an acute frontal sinusitis on her right side, doing the old Ogsden Luc operation, apparently had convalescence or symptomatic cure for about ten years. There developed this swelling or pus formation over the frontal sinus on the right side, demanding its operation and curetting tissue, removing the ethmoid cells and opening up the sphenoid cells. This was followed by recovery in due time. In fact, I had operated upon the right side four times, attempting to gain a cure of this frontal sinus. With the Lothrop operation we determined that the partition wall between the two sinuses had become necrotic, and naturally the right frontal was becoming infected from the left. So we incised over the left eye, doing a Lothrop operation, making the wall very narrow between the two sinuses, did a simple plastic operation in the scar of the right side; and you will see from this picture over the left eye she has absolutely no scar whatsoever, and over the right eye—the side of the Ogsden Luc operation—appears a perceptible scar.

In the colored boy, whose picture I will pass around, was a pan-sinusitis (both sides). I used the Lothrop operation upon him, removing the ethmoid and sphenoid cells on both sides. None of that showed since the operation, and he is perfectly well, having submitted since this operation to the double Caldwell Luc, and he is now free from pus in all sinuses.

The last patient is a typical Lothrop and you can see the scar down on the side of the nose (indicating).

I have only a minute or two to finish the discussion and will only bring out a few points. The Lothrop operation offers the largest opening for the frontal sinuses into the nose, and secures the best drainage and ventilation for these cavities. It is perfectly easy through the external opening to remove the ethmoid cells and open the sphenoid of the opposite side as in operating in pansinusitis cases. The instruments are always in full view and one is able at all times to protect the posterior wall from injury. The after-treatment is easy and of short duration and stress must be laid upon the inadvisability of washing.

I brought the burrs to show that they have a flat instead of a cutting surface on all sides. We find the use of the flat surface of the burr, protecting the brain plate of the frontal sinus is of decided value. These (indicating) are dilators for keeping the opening open, after the Watson and Williams design.

Dr. J. A. Stucky, Lexington, Ky.—The operation, as described by Moore and Lynch, is practically the only operation I have performed upon the frontal sinus in the last five years. I did not know until recently that it was a Lothrop operation. I think that the Killian operation has practically had its day. We have had cases of ugly deformity resulting from them that we can not get rid of. The Lothrop operation, it seems to me, fulfills every indication that is called for by the Killian operation. Dr. Moore stated that there were two things to be obtained by the operation,—ventilation and obliteration of the sinus. The last thing we want, it seems to me, is to obliterate the sinus. Our surgery differs from all other surgery in that it must give ventilation as well as drainage, and we must leave the sinus in a condition to be drained and ventilated. For that reason I do not remove the anterior tip of the middle turbinate, but remove the whole turbinate, because I have been troubled afterward with the formation of granulations or polypoid degeneration. I want to emphasize one thing that Dr. Lynch mentioned as he sat down, and that is the advisability of not washing out the nose and the sinus. Our aim should be as soon as possible to make the mucous membrane work from within outward; make it cleanse itself, and we can get a great deal of help in that direction by simply removing the crust, wiping out the floor of the nose, stimulating the secretion of the membrane by giving increased doses of iodin or muriate of ammonia.

Another point is to save the orbital wall if you can, but remove the floor. I have not been using these rasps that have been shown, but I am very much pleased with them, and am going to have them. I have been using the small size Kerrison forcep for that purpose and have been getting an opening large enough to admit free drainage and free ventilation. After this it is important to teach your patient how to blow his nose so that he may do away with the atomizer and douche bag. I have stopped using oil as a basis in any of my solutions. It simply plugs up the mucous membrane so that it interferes with the normal secretion of mucus.

Dr. E. W. Carpenter, Greenville, S. C.—This operation is not a panacea for all cases of chronic

frontal sinusitis. We are still going to find cases where a Killian will be necessary. To illustrate, recently I saw a man with an inflammatory mass over the temporal side of the right orbit, making a diagnosis very difficult. Opening him up, I found a very small sinus, very narrow and leading straight up on the forehead, with no connection whatever with the inflammatory mass in the temporal region. Extending the incision in the soft parts to include this region, a boney necrosis extending into a very narrow thick-walled cavity was discovered and this was followed into the nose. Removing the external table of the frontal bone between the first sinus and this second one, a third cavity was discovered. Thus we had three long narrow frontal sinuses with very thick walls, each emptying into the nose through its own duct. Only the external sinus appeared to be diseased.

Thus we can readily see how a Lothrop operation would have failed because it would have been a mechanical impossibility completely to open and exenterate all of these sinuses through the initial opening. Nothing short of complete exposure of these cavities with thorough removal of the thick dense septa would effect a cure.

Dr. Moore (closing).—I wish to say that Dr. Lothrop does recommend douching the nose by an alkaline douche after the second day. I did not do this in one or two of my cases because the patient did not return to have it done, and I found that he got along just as well without it. Lothrop's original article, as published in the Transactions of the Laryngological Section of the American Medical Association in 1915, is very beautifully illustrated, and to you who are interested I would recommend that you look up this article. Dr. Lothrop, who is Assistant Professor of Surgery at Harvard, wrote, in 1893, a monograph upon the anatomy of the frontal sinus which is one of the most complete accounts in our literature.

I am not sure that Dr. Stucky removed the partition between the sinuses. Did you?

Dr. Stucky—I think so. I had to X-ray the lesions.

Dr. Moore—It is very necessary to remove the partition and also a portion of the nasal septum so that you can get through either nostril into the sinus. You get much more space that way.

The case that Dr. Davis reported, where he found three sinuses on one side, is of course an anomalous one, but I think in cases with these partitions that all three could be broken into one sinus and drained down into the nose by removing the nasal floor of the sinus.

SOME OBSERVATIONS IN LARYNGEAL DIPHTHERIA*

By Joseph B. Greene, M.D.,
Asheville, N. C.

The very great importance of laryngeal diphtheria is my excuse for bringing this subject to your attention at this time. If I am able to arouse the interest of the members of this Section to the importance, and likewise the seriousness, of this form of diphtheria, I shall feel that your time has not been wasted in the presentation of this paper.

Our opportunities as specialists for saving life by operative procedure, compared with that of the general surgeon, is limited. So it is our crying duty, and likewise our great privilege, to make use of the life-saving procedure of intubation when the opportunity is offered. In the large cities of the country it is usual to remove patients suffering with diphtheria to a hospital for infectious diseases where intubation, or less frequently tracheotomy, is performed on the cases with laryngeal obstruction. This is usually done either by a specialist connected with the hospital, by a general practitioner, or a pediatrist on the service at the hospital. However, in the South we are seldom blessed with hospitals for acute infectious diseases such as diphtheria. So we are usually called upon to render aid to these distressed patients at their homes, either in the country or among the poor and neglected of our cities.

It would be needless to say that the frequency of laryngeal diphtheria is in direct proportion to a failure of the early use of antitoxin. Yet, at times, no one is culpable for failing to make an early diagnosis of laryngeal diphtheria; particularly is this the case where the lesion is primarily in the larynx and where the nasal and pharyngeal mucous membranes are free from diphtheritic inflammation. The cases frequently seen are those where no physician was called until the laryngeal symptoms were well advanced.

In discussing the subject of laryngeal diphtheria I shall not go into every phase of this much-dreaded disease, such as its pathology and bacteriology, but rather confine my remarks to some of the essentials in the diagnosis and treatment of this condition. The diagnosis of this affection is not at all times easy, and it is a rule rather than an exception that the diagnosis must be made from the history and the clinical symptoms. So urgent are the symptoms that usually no time is permitted for a laboratory diagnosis. In fact, cultures from the throat of primary laryn-

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Tenth Annual Meeting, Atlanta, Ga., Nov. 13-16, 1916.

geal diphtheria are positive in only about 60 % of the cases.

The earliest symptom of laryngeal diphtheria is a little hoarseness associated with a croupy cough, soon becoming metallic in character. This becomes gradually worse until in a few hours the patient has difficulty in getting sufficient air. The patient becomes aphonic and infants are unable to cry out aloud. There is soon noted a stridor, heard both on inspiration and expiration. Restlessness increases and there is noted a marked suprasternal and substernal retraction with dilatation of the alae nasi. All the accessory respiratory muscles are soon brought into play to supply the patient with the much-needed oxygen. If unrelieved at this time, the patient becomes gradually worse and there is soon noted a certain cyanosis and the stridor becomes louder and the restlessness becomes greater with all the appearance of air hunger. The respirations at this time are greatly increased and the pulse quickened from the added burden placed upon the heart. If the obstruction remains unrelieved, the cyanosis changes to a pallor and the restlessness becomes less, which should not be mistaken for an improved condition; and death soon supervenes if the patient is not relieved of his respiratory distress.

The temperature in laryngeal diphtheria is, as a rule, not high and there may be almost none at all. The membrane may be primary in the larynx, or may be an extension downward from the nose or pharynx. According to Lynah it may begin in the trachea or the bronchi and extend upward to the larynx. The diagnosis is much easier where a distinct membrane is noted in the pharynx. There may be an extension of the membrane down into the trachea, and even into the bronchi. Lynah, of New York, has reported a series of primary tracheo-bronchial diphtheria diagnosed with a bronchoscope. It should be remembered that the dyspnea in laryngeal diphtheria is a gradually increasing one and there is usually an absence of the intermissions which occur with spasmodic conditions of the larynx.

Acute laryngitis, simple croup so-called, is likely to come on at night rather suddenly and responds to the usual treatment. A croupy condition in children, however, continuing into the following day, is suspicious of laryngeal diphtheria. In fact, Place, of Boston, says every case of laryngeal dyspnea in a child should be regarded in the light of diphtheria until proven otherwise. In every case with laryngeal symptoms the pharynx should be first inspected for massive tonsils or bulging abscess, either retropharyngeal or peritonsillar, which might be responsible for the obstructed breathing. It has been noted that in obstructions above the glottis the stridor is inspiratory in character, while below the larynx, as in foreign body cases, the stridor is more expiratory in character. In laryngeal diphtheria the stridor is both inspiratory and expiratory.

As before stated, the diagnosis of laryngeal diphtheria must be made from the history and the clinical symptoms without the aid of the microscope. Laryngeal symptoms occurring in a patient with a visible membrane in the pharynx is almost certainly laryngeal diphtheria. In obstruction due to the so-called swallowing of a foreign body there is usually a history of such an accident with a sudden onset of symptoms. In laryngeal diphtheria the onset is usually gradual with a slow, but steady, increase in the severity of the respiratory symptoms. If the obstruction is high up, as with massive tonsils or in peritonsillar, or retropharyngeal abscess, inspection of the pharynx will reveal the cause of the dyspnea. The dyspnea in pneumonia may be mistaken for laryngeal diphtheria; but in this condition the stridor is either slight or entirely absent. There is absent also the metallic or aphonic cough of laryngeal diphtheria. A careful physical examination should reveal signs of pneumonia. The temperature in pneumonia is usually much higher than the uncomplicated laryngeal diphtheria. In simple laryngitis of children there is often a history of previous attacks occurring usually at night and becoming better in the following day. In cases of sufficient severity where we are unable to use a laryngeal mirror for diagnostic purposes, resort may be made to direct inspection of the larynx with the laryngeal speculum. Frequently the urgency of the symptoms is such that we

are not justified in delaying operative procedure for accurate diagnosis until we have made a direct inspection of the larynx.

Time does not permit me to enter into a discussion of the subject of intubation vs. tracheotomy, but suffice it to say that the great majority of operators in America prefer intubation to tracheotomy. So I shall now take up the most important factor in the treatment of obstruction in laryngeal diphtheria, intubation.

The indications for intubation are most important, and at times very perplexing. In my opinion it is safer to intubate a bit early in the obstruction rather than wait until the patient is thoroughly exhausted from constant struggling for air. It places a great burden upon the heart, and the delay increases the danger of complicating pneumonia. According to Place, of the 1,553 intubation cases occurring at the South Department, Boston, between the years 1895 to 1904, the mortality was 44%. Of the 685 deaths occurring in this series of cases, pneumonia was responsible for 46.6%. In determining the time when the intubation tube should be inserted, we must consider in the first place the severity of the symptoms and likewise the accessibility of the patient to the doctor. In remote districts out of easy reach of the physician, intubation should be performed relatively early. There is another factor influencing the time for intubation and that is the quantity and method of antitoxin administration. Of this I shall speak later.

The technic of intubation which I prefer is to place the child upon a table, snugly wrapped in a sheet to restrain the movements of the extremities, and the head slightly raised by a few thicknesses of sheet or blanket. The next step is for the operator to stand beside the table on the patient's right. One assistant holds the patient's head firmly while the other assistant stands at the foot of the table to restrain the movement of the lower extremities. The surgeon next inserts the mouth gag, preferably a self-retaining one. The Whitehead answers the purpose well. The left index finger of the operator is quickly introduced and the epiglottis raised, and at the same time the tip of the finger is placed over the eminence of the right arytenoid. It is very important to raise the epiglottis before attempting to introduce the tube. This tip of the left index finger on the arytenoid is to be the guide to the entrance of the tube to the larynx. Just as the tube is felt to touch the palmar side of the index finger on the arytenoid the right hand is quickly raised and the tube pressed gently into the larynx. The left index finger presses the intubation tube snugly in place and the introducer is withdrawn by a reverse movement of the wrist. In introducing the tube it is important always to keep in the median line. If the operation is successful it is evidenced usually by a cough which is distinctly tubular in character and the symptoms of respiratory distress soon vanish. Should the child persist in spitting up the tube without an effort at coughing, the chances are in favor of the tube's having been introduced into the esophagus. It is much easier to intubate the esophagus than the larynx. After the introduction of the tube it is desirable to wait a few minutes until the cough has subsided before cutting and removing the attached string. It is very important for the surgeon to keep in close touch with his patient in case the tube is coughed up or becomes clogged and serious symptoms ensue. Should the patient be in the country, as is so often the case, it is far better for the doctor to remain with the patient for several hours, and preferably longer.

In connection with the operation of intubation I might mention that some operators prefer to introduce the tube with the patient in an upright position. The child is held firmly by the assistant and the same procedure is followed as when the patient is lying upon the table.

The question of removal of the tube comes up for consideration and is often a puzzling matter. It has seemed to me better to leave the tube in from five to seven days unless one wishes to take the risk of having to reinsert it. In any case, the operator should remain at the bedside for some time after the removal to watch for a return of the obstructed breathing, which may not be immediately on removal of the tube. At the first sign of the return of restlessness and dyspnea it is better promptly to reinsert the tube

and wait a few more days before again attempting its removal. I might mention at this time that the technic of extubation is practically the same as intubation, in so far as the insertion of the extractor into the tube is concerned. Extraction is done with a reverse motion of the hand and forearm to that used in intubation.

The nourishment with a tube in the larynx offers fewer difficulties than one would suppose. As a rule, they take semi-solids better than liquids, though water and milk are often swallowed without difficulty.

Without going into details as to the medical treatment, I would say that stimulants are used when indicated, chief reliance being placed upon caffeine, strychnine, atropine, alcohol, and camphorated oil hypodermically.

As to the serum treatment of laryngeal diphtheria, I believe that these cases should have large doses of antitoxin, preferably into the vein. In case of difficulty in locating a superficial vein at the elbow or elsewhere, as may be the case in very young children, my next preference is into the muscles at the middle of the outer side of the thigh. Park, of New York, has shown that absorption from the subcutaneous tissue is very slow, and says in this connection: "The difference during the first day in the amount of antitoxin in the blood when injected intravenously is ten times greater than when injected subcutaneously."

It is my custom to use the intramuscular method (the muscles of the middle of the outer side of the thigh) instead of the subcutaneous method for the usual forms of diphtheria not presenting symptoms of great severity and in cases of not too long duration. Absorption from the muscles is much more rapid than from the subcutaneous tissue. In laryngeal diphtheria and all other forms of considerable duration and severity, I prefer to use antitoxin intravenously. It is easier to use a smaller needle than goes with the antitoxin syringe; and a syringe considerably larger than the ordinary hypodermic syringe is to be preferred. However, in the absence of a special syringe, or a hypodermic syringe, the use of the ordinary antitoxin needle, which comes with the container, does not offer insurmountable difficulties. The quick results from such methods of administration justify the effort. It is advisable to warm slightly the antitoxin, taking care not to coagulate the albumin, and inject slowly into the vein.

As a preventive measure the subcutaneous method seems rapid enough. As to the dosage, one can not be sure of the amount of toxin requiring neutralization by the antitoxin; so it is far safer to use more than necessary rather than an insufficient dose. Furthermore, as it is impossible to say when a mild case may assume a malignant form, I have adopted as a rule to give as the initial dose in mild cases as much as ten thousand antitoxin units. In severe cases I would give larger doses.

Park says that sufficient antitoxin should be given at the initial dose, and should a second dose become necessary it would indicate that the first dose was insufficient. Fortunately the cost of antitoxin is much less than formerly, — the only objection to the use of generous doses of antitoxin. I have never had cause to regret giving too much antitoxin, though I have regretted giving too little.

In conclusion, I wish to say just a word about the fear of anaphylaxis following antitoxin administration. I am convinced, from my study and experiences, that the danger from a practical standpoint is too remote to be considered except in older children and adults, where there is a history of hay fever, asthma and sensitiveness of the nasal and conjunctival mucous membranes to emanations from the horse. In my opinion many more lives have been sacrificed from the fear of antitoxin than could possibly result from an anaphylactic shock.

DISCUSSION

Dr. T. W. Moore, Huntington, W. Va.—I think Dr. Greene's paper a very timely one. I think it is well for us to be impressed with the idea that it is our duty to do this work, which is nearly always one of charity. When commercialism is invading to so great an extent all the professions, and especially our branch of the medical profession, where the demands for charity are probably much less than they are on the general practitioner, it is well for us to do this work, and there is no act in the realm of medicine that gives greater relief and impresses us more with our ability to save life.

My experience has been that it is in only one

case out of ten that you ever receive any moneyed compensation for intubating.

Not long ago I was called out of town to do an intubation. As I started I received a call from another town to intubate the child of a physician. I telephoned to three confreres asking them to answer this summon. They all replied that they had quit doing intubation. It is due to this growing tendency on the part of the laryngologist that I am emphasizing the humanitarian side of this work.

The last child that I intubated was in our West Virginia hills. I left home on the 2 o'clock train. After leaving the train I drove four miles over a road a large portion of which was in a creek bed. I intubated a twelve-year-old girl, reaching home at 8 o'clock that night. A week later I removed the tube, the child immediately choked up and I had to replace it. After another week I went by automobile to this home over a very rough road, removed the tube from this child, and when I returned home I found by my speedometer that I had traveled ninety miles. The child was cured. A case like this, while a rare one in my locality, is a great tax upon the physician, yet I think it is his duty to answer such a call and let his fellow practitioners know that he is willing to do so.

Dr. Greene spoke about diagnosis. You would think ordinarily that there would be no trouble in making a diagnosis; but I remember some years ago being called to intubate the child of a Hungarian family that spoke no English. The child was twelve months old. The physician who had been treating the child had been called out of town and a neighboring physician had made a diagnosis of laryngeal diphtheria. I intubated the child and it was instantly relieved. That evening when the family physician returned he asked me to come and remove the tube, as the child was choking to death. I did so, and the child immediately coughed up a piece of apple. It is remarkable that the child did not die; but I speak of this simply to show you that it is often very necessary to be careful in making a diagnosis.

Dr. J. A. Stucky, Lexington, Ky. — Since we have had antitoxin, diphtheria has been robbed of nearly all its horrors. The only thing that disturbs us now, as a rule, is the laryngeal type of which we have just heard. My experience in the last four or five years has justified me in not placing so much reliance upon the intubation tube as I did formerly. I have had erosion of the larynx; I have had stricture; I have had the patient cough up the tube and die before it could get help; and so my rule now is, after giving a full dose of antitoxin (and to a child under five years of age I think 5,000 or 10,000 units is sufficient), if that child lives close enough to me to get to it early, or quickly, I intubate. If I must leave it with a trained nurse I prefer to do a tracheotomy. Then, if the membrane separates, the exudate can be picked out of the opening. The trained nurse can keep a tracheal wound open and care for it. She can not introduce an intubation tube. It is not easy accurately to insert an intubation tube without producing some traumatism, and it is harder still to extract that tube after it has been in there a few hours. I rarely ever leave an intubation tube in the larynx longer than twelve to twenty-four hours. If it must stay in longer than that I prefer to resort to tracheotomy, and in latter years I have not had the troubles we had in former years with infection and pneumonia.

Dr. Charles Huff Davis, Knoxville, Tenn.—I started to say something like Dr. Stucky has just said, but I was just a little bit afraid. He is an old gentleman in the cause and I take courage and state that I am with him in the tracheotomy business, and I am going to report some "end results."

On one occasion I was called upon to do an intubation. The physician had given heroic doses of antitoxin and it seemed that the membrane was on the point of dissolution. I made of my intubation tube a piston, if you please, and evidently pushed a plug of this membrane down into the bronchus, and the child died immediately from the operation. This was in the second or third case of similar history that I recall now.

The doctor from Huntington has driven ninety miles to put a tube in. If that child, when the membrane dissolves itself, coughs some of the dense membrane into the tube, he has to get it extracted immediately and get it cleaned out; but with the ordinary tracheotomy apparatus the physician or nurse can teach the members of the family the care of the tube, just when the central core of the tube should be removed, just how to wash it and to clean it thoroughly of necrotic debris, and how to replace it. Moreover, it is more surgical to meet the necessity in this way.

I have seen erosions of the larynx and I have seen strictures; but I have never seen a child cough up a tracheotomy tube after it is put in its place properly.

A child can breathe through its nose and mouth in the presence of an intubation tube, and this has the advantage of being the normal state of affairs. It has to breathe, of course, through the tracheotomy tube when a tracheotomy is done. We should be careful to keep the air properly moistened and warmed to meet the necessities of this new method of breathing. I have seen quite as many cases of pneumonia follow intubation as I have seen follow tracheotomy. Therefore, the great facility with which you can keep a tracheotomy tube open, especially if you are not going to be there all the time yourself, warmly recommends itself to me. I like to keep the air impregnated with lime fumes, and mention compound tincture of benzoin. When possible to be used, turpentine fumes are available, but I do not recommend them in all cases because of the tendency of the kidneys to become involved in active nephritis.

If the general practitioner would make up his diagnosis in a hurry, neither intubation nor trachotomy would ever be indicated. Most frequently the cause of stenosis of the larynx, in childhood, is diphtheria. He should get to work on it. Heroic doses of antitoxin are always indicated. We call them heroic because there is some high-sounding theory that a child must have so many units dependent upon bodily weight. I never figured this out because I have figured that it was the lively toxic elements of the bacteria that we had to combat rather than

the weight or age of the child. An initial dose of 25,000 units is necessary very often, and quite as frequently you do not have to repeat the dose.

The theory of putting antitoxin into a child's vein is very beautiful and is warmly recommended. Those of you who have tried to find a suitable vein in a child, however, know that it is not a cinch.

If you give a sufficient dosage of antitoxin intra-muscularly you will find that it will be absorbed quickly enough.

Dr. R. C. Lynch, New Orleans, La.—The question of diphtheria seems to revolve around intubation versus tracheotomy. I belong to the tracheotomy group in preference to the intubation group, and would like to state my side of the situation. So far my results or my cases number fifty-two tracheotomies without a single death due to the tracheotomy, without a single pneumonia consequent to the tracheotomy, and so far I have never performed one tracheotomy that the apparent conditions or the conditions of the trachea and bronchi have not justified the operations.

In four instances I was able to preserve the life of an individual by the removal of the membrane through the broncoscope through the right and left bronchi, and those children are living, living at the present time. One tracheotomy was done following an intubation.

Papers upon diphtheria or papers upon the question of intubation never bear upon the subject of what the death rate is when tubes are coughed out and not replaced in time. Again, there is the question of stricture or stenosis of the larynx following or caused by the operation of placing the tube in the larynx. Jackson leans to tracheotomy in preference to intubation. The men who do intubation have always series of cases of retained tubes. One of our confreres in New Orleans reports 12 cases of stenosis of the larynx following intubation where the tubes have had to be retained from four months to two years. No such thing has happened in a tracheotomy case. In no case has the voice been interfered with in any way, and these cases, except for a tiny scar externally, have come back to the serviceable larynx.

I believe that the retention of a foreign body in the larynx for any length of time must produce some sloughing of tissue in the mucous membrane in the larynx. There is loss of substance, scarring, and there must be some interference with the function of the part.

It was my pleasure just recently to attend with Dr. Lynch, of the Willard Parker Hospital, some 12 or 14 cases of intubated children. The tubes were in over seven days, and in one child reintubation had been done ten times. This child was still wearing this intubation tube and the conditions, comparatively speaking, to those of my tracheotomy cases, were far worse.

Now, I believe that our enthusiasm along the lines of intubation has been generated by our Boston clinics and some of our New York clinics, and I do not see how it is possible for men to intubate a larynx in the country in our patient's own home and allow that child to remain in such a location alone. Certainly no nurse, no man of general practice, can intubate successfully unless he has had some special training, and it is my idea if the patient has to be intubated that patient should not be outside of sight of the intubator.

In both instances, then, it would seem to me in dealing with laryngeal diphtheria cases especially, that tracheotomy is very much the safer plan for the life of the individual and for the function of the larynx.

Dr. E. W. Carpenter, Greenville, S. C.—What I have to say is from a limited experience of twenty-two years. I have published results of over 48 cases in private work. In nearly all of them the cases were in the country and at a distance of from 10 to 40 miles. In only three or four was I able to procure the services of a trained nurse. These cases were all intubated.

I will not enter into a discussion of the relative merits of tracheotomy and intubation. I have always intubated and have never had to do a tracheotomy subsequently or have I thought a tracheotomy would have changed the results in unsuccessful cases. I expect I had better knock on wood, because some day I will have to put a tube in and it will not reach below the obstruction, and in such an event as that I will use a long tracheal intubation tube. We ought never to undertake an intubation without being prepared to open the trachea in case it is necessary, but in cases where an intubation tube will not reach below the obstruction there is little chance that a tracheal tube will be of benefit. It is very interesting to discuss the diagnosis of these intubatious cases. I believe that 99 % are diphtheria, either of the larynx, trachea or bronchi. Why are only 60 % of cultures positive in laryngeal diphtheria? Dr. Greene mentioned 60 % of cases of laryngeal diphtheria in a large number of statistics.

Does an acute or active diphtheria always have a membrane? That question arose in my mind from this fact: In sixteen cases of a series I published two years ago the membrane was not visible by the use of the Jackson speculum.

In nine of these cases cultures were taken; eight cases out of the nine were reported positive. I almost came to the conclusion at that time that active diphtheria did exist without the presence of a membrane, but the solution or answer to that question is that we have pulmonary diphtheria, which has not been recognized in this country except by a few men, and not by them until very recently.

Dr. W. Likely Simpson, Memphis, Tenn.—Just a word or two about antitoxin. I believe as soon as we find out what the difficulty is we should give large doses of antitoxin early. I do not believe 20,000 units is any too much for the laryngeal cases at the beginning. Ordinarily that would be sufficient, but if we see the case late, when it is doubtful whether anything will do any good, I think we should be very careful about giving these large doses. I believe in the cases which are seen late and the child is very low that to give these very large doses we are likely to cause the death of the child from shock.

Just a word or two about the length of time to

leave the tubes in the larynx. Usually, if you see the case of laryngeal diphtheria early and give antitoxin in sufficient dosage, in a few days that case will be very much better, and often it would be well to remove the tube at the end of 36 or 48 hours. If this can be done, one will not have severe ulceration and the scar formation that has been spoken of. If the case has been seen late, it is already about to get well. The membrane is about to be thrown off. In that case it would be well to remove the tube rather early, and certainly the operation in that case will not produce a laceration and strictures, but the scar formation would have already taken place, even if the intubation had not been made and had nothing whatever to do with the intubation.

Dr. J. H. Foster, Houston, Tex.—I had decided not to prolong this discussion, but there has been so much said in favor of tracheotomy in preference to intubation that I want to go on record on the other side. I do not believe we ought to do a tracheotomy in any case unless we are satisfied intubation will not do. In these cases we are usually called upon in the outskirts of the city among the children of the poor, and I believe a tracheotomy done in a dirty home, taken care of by the people in general, usually results in an infinitely higher death rate than in cases of intubation.

I believe a case of tracheotomy requires very much more careful nursing than a case of intubation, and I believe a much larger death rate will result. I have had in the last twelve years only four cases where I thought it necessary to do a tracheotomy, in cases where I have either done an intubation or the conditions were such I did not think an intubation would do; and in cases where I have done a tracheotomy, where earlier intubation would not relieve them, the cases have died.

I think the point Dr. Simpson stressed a while ago is an important one. I do not believe a tube ought to be left in as much as seven or eight days. I think if we put it in there and leave it two or three or four days at the outside it is sufficient; and I have never seen any bad results from intubating in the cases mentioned.

Dr. C. L. Kibler, Columbia, S. C.—If the diagnosis is made early enough, you will not have to intubate or perform a tracheotomy, either. Whenever we are called to cases of this kind the fault generally has been that of the physician in charge in not having made an early diagnosis, and when made, not having given large enough doses of antitoxin. My experience has been in those cases where an intubation or tracheotomy is called for, I prefer a tracheotomy, as I think it safer in the long run. I wish to emphasize this fact and state again, in the cases I am called upon to operate, that the fault in a great measure lies with the parent or the physician in attendance, in not having made the proper diagnosis, or where the diagnosis was correctly made but not having given a sufficient amount of antitoxin. I am considered a crank at home on the subject of large doses of antitoxin. I do not think, in a case of diphtheria, you can give too much, and you certainly can give too little. You must not consider the age of the patient, but the condition. If you have diphtheria you do not know what hour—what moment—you are going to have serious complications, and you must not wait until they come before giving large doses of antitoxin and then possibly do no good, as absorption of the drug is too slow. Give heroic doses, and by heroic doses I mean 10,000 to 20,000 units the first dose in laryngeal diphtheria. If you give that in the beginning absorption is good and generally no more is needed. If you give a small dose, say 1,000 to 2,000, and in six to eight hours give the same amount, you will find the temperature higher, respiration worse and the patient more toxic. In the laryngeal and pharyngeal type if you find your patient not improving and having given large doses of antitoxin in the beginning, do not wait too long before giving the drug intravenously. If that is followed out and we are called in time, we will not have to intubate or do a tracheotomy.

Dr. M. Pennington, Mt. Vernon, Ky.—It seems this is a fight over intubation vs. tracheotomy. Personally, I am in favor of intubation. The doctor mentioned the form of practical intubation by Jackson on Crozier's laryngoscope. O'Dwyer's intubation set is very rapidly taking position when it comes to intubation. They are now doing intubation by direct observation. Dr. Lynch mentioned stenosis. I think you will find cases that are intubated by direct observation generally produce a trauma. If you have O'Dwyer's intubation outfit you will find a great deal less mortality in intubation than in tracheotomy.

Dr. M. M. Cullom, Nashville, Tenn.—It seems we are divided into two camps—those who advocate intubation and those who believe in tracheotomy. I would like to place a foot in each camp in accordance with the teaching of my instructor at the Children's Hospital in Vienna. They believe strongly in intubation. They insert the tube and at the end of five or six days remove it. If the obstruction is not relieved they immediately do a tracheotomy. They do not believe in leaving the tube in longer than five or six days. If the tube is left in longer than a week stenosis is apt to result. I believe this is the safest position to take in this question. But the safest thing of all is to make the diagnosis early and give a large dose of antitoxin. Do not wait for the bacterial examination, but get the antitoxin in as early as possible.

I don't know what the experience of the other men is, but I find diphtheria cases are passing out of my work. I am very glad for them to pass into the hands of the general practitioner or the children's specialist. When a case comes to me I try to turn it over to the family physician or the children's man.

Dr. Greene (closing).—I want to say I very much appreciate this generous discussion of my paper. I purposely left out the question of intubation vs. tracheotomy, because I felt the great majority of American physicians prefer intubation, and besides I did not want to lengthen the paper too much. I was greatly pleased that there was no opposition to my remarks on large doses of antitoxin. I was very much pleased with that. I think we are getting on common

ground. Dr. Stucky did speak of 5,000 units, but I believe he will raise it to 20,000—

Dr. Stucky:—Repeated in six to eight hours.

Dr. Greene: Yes, but you don't have to repeat it if you give it in sufficiently large doses.

Before I take up tracheotomy I would like to ask Dr. Lynch whether his tracheotomy cases were in hospitals or private practice.

Dr. Lynch: Hospitals.

Dr. Greene: That is just the point. His excellent results were in hospitals. Why? Because, as I emphasized, our patients are in private homes in remote parts of the city or country, where the operation of tracheotomy is a difficult surgical procedure. I know of few more difficult operations than a hurried tracheotomy in the middle of the night by a poor light, often with little or no assistance.

One of the saddest cases I ever had was a tracheotomy case in the country where the tube became stopped up; Dr. Lynch's case did not get stopped up because he had a trained nurse in the hospital. In the country a tracheotomy tube does get stopped up, pneumonia results, and I think the danger is great. We must take the experience of those men in Boston, Chicago and Philadelphia who have a large series of cases, where they intubate instead of doing tracheotomy.

Dr. Carpenter asked why only 60 % of laryngeal cases are positive. I have used Place's statistics as published in Osler's "Modern Medicine." That means primarily, of course, where the pharynx is not involved. The culture swab does not come in contact with the lesion in the larynx.

Dr. Collum speaks of turning these cases over to the pediatrician. I think this is our peculiar work. We ought to be able to do this work better than any general practitioner or pediatrician. I appeal to you to do it yourselves rather than turn it over to them. We ought to do it better. It is our line of work.

NEW AND MODIFIED INSTRUMENTS

By Harvey B. Searcy, M.D.,
Tuscaloosa, Ala.

Fig. 1.—The Searcy tonsillectome with a dull sliding blade, reported in "The Laryngoscope" of September, 1914, modified by a large oval ring for the thumb. This thumb ring allows the instrument to rest firmly and comfortably in the palm of the hand and gives a longer reach to the fingers.

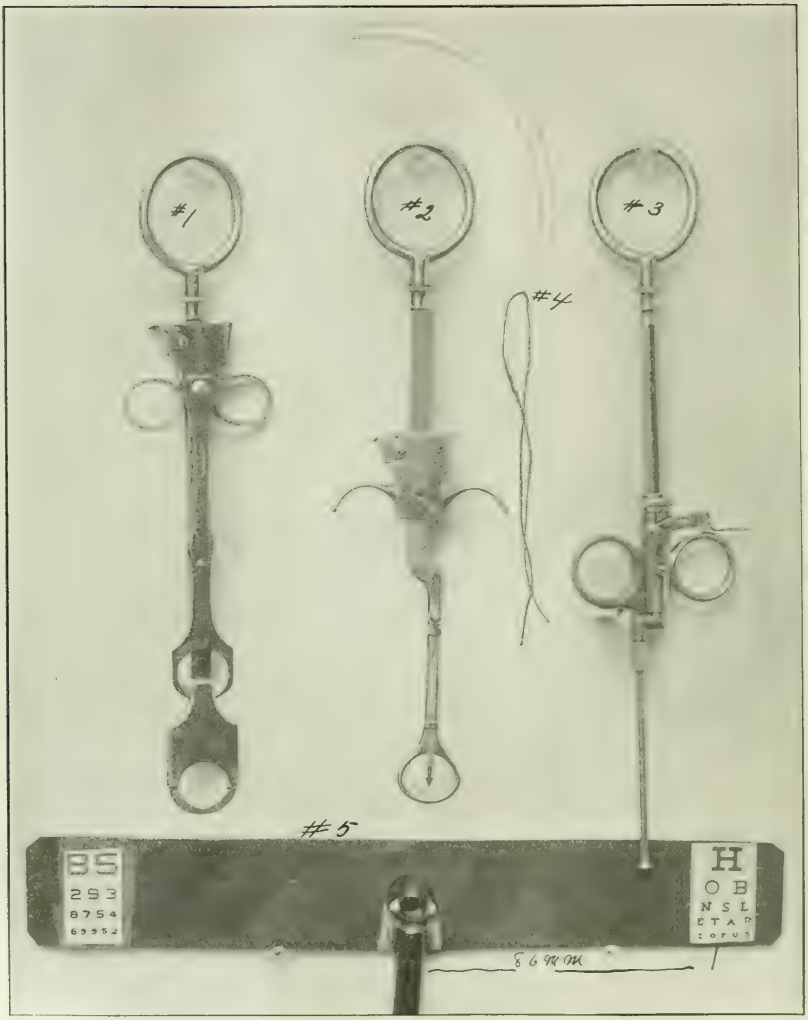
Fig. 2.—A Beck tonsillectome snare modified by the large thumb ring allowing a firmer and more comfortable grasp of the instrument. Also there is placed on the "tonsil end" of the instrument a spear to hold the tonsil after it is snared off, and therefore eliminating the need of vulsellum forceps.

Fig. 3.—A Boettcher-Farlow snare modified by the large thumb ring. This ring can be used on any of the snares of this type and allows a better grasp of the instrument.

Fig. 4.—A snare wire, doubled, and the loop-end squeezed tight, for introducing a drain of cotton or silk into the nasal duct. After slitting the lower puncta and dilating the duct the smooth loop-end of the flexible snare wire is passed through the duct and out the nostril. The loop is threaded with a cotton or silk thread of the size determined by the amount of stenosis found and the thread is drawn up through the duct by pulling on the upper ends of the wire, which is loosened from the loop of thread formed. A large knot is tied in the loop of thread and this is buried in the sac by pulling on the lower ends that protrude from the nostril. These ends are now cut off within the nose.

The lachrymal sac is drained by the fact that the nasal duct is a long tube in proportion to its diameter, and through capillary attraction and gravity the sac contents are siphoned into the nose. A cotton drain acts as a wick (capillary attraction) and does not interfere with the siphonage of the sac contents, and prevents strictures of the duct after the mucous membrane has been lacerated by the dilatation in allowing time for the wounds to heal. And if the mucous membrane is completely destroyed a fistulous tract is formed. Any operation tending to shorten the drainage canal from the eye to the nose lessens just so much of the affect of a siphon of the natural canal.

Fig. 5.—A retinoscope for using the posterior pole of the optic axis as a fixed place on the retina for the shadow test. A fixed place gives more uniform results than when arbitrary things as an ear, the forehead, a spot on the wall, etc., are taken; and for this fixed place the posterior pole of the optic axis is used, as it is the place of longest diameter of the eye, and is directly back of the centre of the refractive media. The instrument is made on the principle that the angle formed by the visual line and the optic axis is five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degrees (deSchweinitz), and at one meter distance these lines are 86 mm. apart. The letters on the retinoscope are placed 86 mm. from the mirror, and when a patient looks at the 85, etc., with the right eye, or the H., etc., with the left eye, the light from the mirror is thrown upon the retina at the posterior pole of the optic axis. The retinoscope is made wide to shade the unused eye of the operator and to accommodate several rows of Snellen test type.

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AUTHORS' ABSTRACTS

Eye, Ear, Nose and Throat

Subconjunctival Injections of Mercury Cyanid in Ocular Therapy. E. L. Jones, Cumberland, Md. Journal of the Tennessee State Medical Association, January, 1917, p. 345.

For a quarter of a century or more medicines have been injected under the conjunctiva in treating the more rebellious ocular diseases with such limited measure of success as to arouse very little enthusiasm for the method. For many years a very few drops, from one to five, of a weak bichlorid solution were used for its supposed germicidal direct effect. This was painful and caused much trouble and little benefit. Then came the normal saline injections with less pain and more service. Next was advocated the strong brine for retinal detachment, the verdict as to which by itself alone, now is, "Weighed in the balance and found wanting." The prime consideration seems to have been to avoid a great reaction.

Some years ago the essayist stumbled into the belief that it was the great reaction we should encourage and not seek to avoid. The hitherto intolerable pain was found to be rendered almost negligible by long cocainzation of both eyes and adding sufficient morphine to the previously used solutions. Instead of the frequently used small injections a massive single injection, in most cases, or, if repeated, only after the lapse of several weeks was adopted.

The illustration of driving a railroad spike by a few blows of a sledge hammer instead of making a lot of fuss with a track hammer will apply to indicate results. By this massive injection a large percentage of eyes usually removed may be retained and a large percentage of the more serious and intractable disease, injuries and infections can be transferred from the hopeless to the hopeful column.

External Frontal Sinus Operation. Joseph C. Beck, Chicago, Ill., the Journal of the A. M. A., December, 1916, p. 1811.

After briefly reviewing the Roentgenoscopic diagnosis and pathologic changes in frontal sinus diseases, the author states his experience with the various external frontal sinus operations, namely, the Kunt-Coakley operation, the Lathrop operation and his own osteo-plastic flap operation, which latter procedure is outlined as follows:

1. X-ray outline of sinuses.
2. Celluloid model.
3. Skin and subcutenous incision.
4. Dissection of skin flap upward.
5. Celluloid model in place.
6. Incision through periosteum.
7. Chisel or burr outlining the osteo-periosteal flap.
8. Gigli saw engaged and in action.
9. Osteo-periosteal flap turned down.
10. Pathologic condition of one side shown; the other the Halle blunt conical burr and Halle protector in position.
11. Rubber tubes and gauze in place.
12. Both flaps replaced and wound sutured.
13. Final result compared to an unfortunate outcome of a Killian operation.

AUTHORS' ABSTRACTS

Surgery, Gynecology, Obstetrics and Genito-Urinary Diseases

(Continued from page 160

Also the non-protein-nitrogen—which includes the urea and the amino acids—is present in equal amounts in the blood of mother and fetus. As the latter substances represent protein-building material, nitrogenous food as well as nitrogenous waste passes through the placenta by the simple process of diffusion. Accordingly, the supply of material for the construction of fetal protein is governed by the amount of amino acids in the mother's blood and likewise the removal of urea from the fetus is regulated by the speed with which it is eliminated from the maternal circulation—a function, of course, of the kidneys and sweat glands.

Alterations in the composition of the fetal blood, independent of the mother, occur in asphyxia, if this is due to impairment of the fetal heart. In this case half again as much urea as normal appears in the fetal blood. Thymic death is not attributable to defective heart-action, for the blood-urea is normal; and probably this condition depends upon the respiratory center.

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EDITORIAL DEPARTMENT

EDUCATION THE REMEDY FOR THE HIGH COST OF LIVING

It is a remarkable fact that very few educated people know anything of dietetics, and nothing of the science of nutrition, of what we should eat or why we eat different articles of food. The colleges graduate thousands every year who are supposed to be familiar with the classics and higher mathematics, not one of whom—with the exception of a few special or graduate students in four or five of the large universities—has been taught anything about the most essential thing in life, viz., the nutrition of our bodies.

We trust the selection and preparation of our food to the most ignorant class of people and we at three meals a day without any consideration as to whether or not our menus are suited to our nutritional needs. Men specify the caloric value of the coal used in their engines and they know that too much or too little, or improper fuel, interferes with the energy-output of their machinery. Yet they never seem to know, or to care, about the quantity or the quality of the food burned in their bodies. Apparently we eat as do the lower animals, merely to gratify our perverted appetites, and without their instincts as to the foods suited to their digestive organs and nutritional needs.

DANGERS OF PROSPERITY

The medical director of one of the great life inusrance companies once said to the writer that the worst class of risks that insurance companies carry is the successful business and professional man who applies for policies of from $50,000 up. He gave as among the reasons why these valuable citizens do not live to their age expectancy, that they are able to buy all the luxuries of life and that they over-eat, particularly of the most expensive protein, meat, and that they, while rarely intoxicated to the degree of drunkenness, often drink to excess, and die early from diseases of the arteries, kidneys, heart and brain. With the present wonderful prosperity of the American people and therefore with the means to gratify their perverted appetites, there is danger of wide-spread degeneracy from over-eating and drinking. Wise men, however prosperous, will not depart from the simple life, particularly with regard to the things they eat and drink. A notable example is the President of the United States who is said to eat the simplest food, which, in the uncooked state, perhaps does not cost more than fifty cents a day.

RATIONAL, WELL BALANCED DIETARIES

It must not be considered that all people over-eat, because many, particularly the mothers and house keepers, do not eat enough and suffer from deficient nutrition. Many people eat too much of one kind of food and not enough of others. The proper preparation of food is also important. Alfred McCann in his book, "Starving America," claims that the present methods of milling flour by removing the outer layer of the grains of wheat, deprives us of its life-giving principle, the vitamins, that are needed for proper nutrition. The whole wheat, or "Graham" flour, is therefore cheaper and more wholesome. Polished rice has been proven to be the cause of a frightful disease, beri-beri, among the Chinese and sailors whose nourishment consists largely of rice. The cheaper un-

polished rice is more suited to our needs. Goldberger has proven that a diet with an excess of carbohydrates, i. e., corn meal, potatoes, syrup, etc., and a deficiency of the proteins, is at least an exciting, if not the sole, cause of pellagra.

EDUCATION THE REMEDY

Having called attention to the dietetic errors of the human race, what is the remedy? We have observed that most people had "rather die eating than to di-et." Thomas Jefferson is credited with saying that "in so far as the uplift of the human race is concerned, the present generation is already lost." He therefore devoted his best years to the education of the youth of his beloved Virginia. We believe that the remedy lies in *education*, though we cannot agree that adults are not capable of accepting and being benefitted by scientific truth. The ravages of tuberculosis, typhoid fever, yellow fever, malaria, small pox, plague and other scourges have been controlled or lessened by education, particularly among the adults of the race.

A NATIONAL DEPARTMENT OF HEALTH

The greatest need of the Nation is an adequate Department of Health, one of the most important bureaus of which should have the most thoroughly equipped laboratory in the world devoted to the study of nutrition in human beings. Our Government spends millions in its Department of Agriculture in studying the nutrition of plants, and much attention has been given by Government experts to the nutrition of animals, and the money is well spent. But very little, however, is appropriated for the study of the nutritional needs of man.

The little laboratory in which the wonderful work of Atawater was done, and the little larger one now presided over by Longworthy in the Agricultural Department, have accomplished such remarkable results that our Government should be convinced of the importance of enlarging the scope and usefulness of a bureau of nutrition. If such a bureau could be provided with the funds to furnish reliable information on diet and nutrition to the press and to the public it would add much to promote American efficiency and longevity.

In discussing a Department of Health it should be understood that it ought to be evolved from the present Public Health Service, which with its officers should be on the same basis as the War and Navy Departments. The United States Public Health Service has done, and is doing, wonderful work with its pitifully meagre appropriation, but its efforts from lack of funds, have been devoted almost entirely to the prevention of the infectious and contagious diseases.

Perhaps when the public and our politicians learn that human beings have a money value we may expect governmental aid for larger measures to conserve health and life. Incidentally it may be mentioned that recent studies of the longevity of our public men show that senators and congressment die several years before their age of expectancy. This excessive mortality of our public men from the degenerative disease may not be entirely due to overwork. The luxuries of life in the national Capital may play a part.

TEACHING OF DIETETICS IN SCHOOLS AND COLLEGES

Our colleges should establish departments devoted to diet and nutrition; and every student during his first year should be required to study and know the dietetic and nutritional needs of his body. The subject in simpler form should be taught to every child over ten years of age in the public schools; and through the children their parents could be reached.

With all the people informed regarding food values and the nutritional needs of

the body, decreased consumption of the expensive luxuries would lessen the demand for them, prices of even the commodities would fall, and there would be no problem of the high cost of living. The efficiency of the American people would also be greatly increased and probably from ten to twenty years added to the period for the enjoyment and usefulness of the boys and girls now living under the American flag. Is not the problem of nutrition, which affects life itself, worthy of careful study and consideration by our educators, public officials and by our citizens of all ages, sexes and conditions?

POSTURE IN OBSTETRICS.

Few doctors know of the accomplishments of Frederich Trendelenburg, a noted German surgeon, that Gustav Walcher was an obstetrician of the same nationality, or that George R. Fowler was a celebrated American surgeon. Perhaps more are familiar with the work of that immortal Southerner, James Marion Sims. But all are aware of the helpfulness of the positions bearing the names of Trendelenburg, Walcher, Fowler and Sims.

From time to time important points of vantage have been gained through the adoption of various postures in the several branches of medicine and surgery. What would the gynecologist do without the Trendelenburg position in pelvic surgery, or surgery in general without the Fowler position for infection of the lower abdomen? Similarly, there are preferable positions for kidney surgery, tonsillectomy, thyroidectomy, bronchoscopy, esophagoscopy, proctoscopy and cystoscopy. The exaggerated Walcher position has permitted the normal course of many a labor which otherwise would have had to be terminated either by symphysiotomy or by Cæsarian section.

"Posture in Obstetrics" is the subject of a very scholarly research by Dr. J. W. Markoe in *The Journal of the American Medical Association* for October 7, 1916. His attention was particularly directed to devices permitting of the sitting or semi-setting posture during labor. It seems that the first mention made of the obstetric chair appears in the writings of a Greek physician named Moschion who lived in the second century after Christ. At that time its use was quite general, but passed out, only to reappear in the middle ages in the works of Albertus Magnus.

From that time on some country or other has made wide use of this piece of obstetrical apparatus. In Belgium in the eighteenth century the modifications of these chairs were as numerous as the obstetrical forceps of the present day. So wide was its use in Holland at one time that such a chair constituted a *sine qua non* for every well-equipped bride. The wealthy among the Orientals constructed these seats of ebony inlaid with mother of pearl.

Markoe gives various tables of comparison of the use of the chair and its non-use, all of which speak favorably for the adoption of the former in shortening the first as well as the second stage of labor, and in many instances obviating the necessity of operative intervention. Whatever may be its true merits can only be learned by wide use. In theory at least it seems rational enough to warrant a fair trial of it by accoucheurs who would further the science of their art.

PREVENTIVE SURGERY

We have heard for a considerable time of the value of preventive medicine, and this term has come to be an integral part of the language of our profession. It looks, however, as though the movement which is now taking place in this country for the standardization of first aid were, in

reality, the beginning of what might be called the preventive surgery movement.

In order that we may bring this point out a little clearer, it may be well to review briefly the history of the endeavor to put first aid on a stable national basis. On August 24, 1916, largely through the instrumentation of Dr. Joseph C. Bloodgood, of Baltimore, the American First-Aid Conference was held in Washington, D. C. It memorialized the President, requesting him to appoint a Board for the purpose of standardizing first aid. When the story of President Wilson's administration is written, his acquiescence to this request will be recorded as one of the most far-sighted things he ever did. On November 6, 1915, he appointed the Board,—an unpaid body —as follows: Dr. Richard H. Harte, Chairman; Col. Louis A. LaGarde, M.C., U.S.A., Vice-Chairman; Asst. Surg. Gen. W. C. Rucker, U.S.P.H.S., Secretary; Dr. J. P. Kaster; Dr. Samuel C. Plummer; Surg. A. M. Fauntleroy, U.S.N.; Dr. J. Shelton Horsley; and Major R. U. Patterson, M.C., U.S.A. The Board organized but was without funds. These were voted by Congress to the amount of $2,000 on July 1, 1916, and the Board is now hard at work, with the coöperation of the Bureau of Labor Statistics, which is deeply interested in the industrial phases of the proposition.

Seeking to determine the best standards of first-aid methods, first-aid instruction, first-aid dressings and equipment, and first-aid transportation, the Secretary of the Board, Asst. Surg. Gen. W. C. Rucker, U.S.P.H.S., has addressed a letter to the surgeons of the country asking their coöperation in this plan for the standardization of first aid, not only to meet the emergencies of peace but also to be available in time of war. The response on the part of the profession has been so hearty as almost to amount to an outburst of patriotism. The effect of the work of this Board will be far-reaching as it will place in the hands of the public an authoritative system of first-aid. By reason of the adoption of standard packets and kits their cost of production will be lessened; the gains accruing to industrial concerns and accident insurance companies by reason of a better first aid will be very great, and it may be hoped that the number of infected wounds and permanent injuries will be very much lessened. This is in effect preventive surgery,—a new branch of our art,—and it is hoped that the entire profession in this country will lend its unwavering assistance in this very important work which the President's Board of First-Aid Standardization is carrying out.

MAJOR NOBLE'S ADDRESS ON MEDICAL PREPAREDNESS

One of the essential characteristics of great leaders is the ability to select as their co-workers men who are especially fitted to perform definite service. Major-General Gorgas, in selecting Major Robert Noble, of Alabama, as his aide in Panama and for the same position when he was made Surgeon-General of the United States Army, proved his ability to select the right man for the right place.

Those who know the history of sanitation in Panama say that Major Noble was in efficiency second only to General Gorgas; and his knowledge of every detail of the work in the Surgeon-General's office is considered remarkable. Indeed he is recognized as one of the ablest and one of the most efficient men in the War Department at Washington. Therefore, when Major Noble consented to deliver an address before the Southern Medical Association on "The Relation of the Medical Profession to Medical Preparedness" we expected an authoritative presentation of a subject of great importance to the American people and of very great interest to the medical

profession. His address is published as a special article in this number of THE JOURNAL and should be read by every patriotic physician. It should not only be read but medical men should realize from reading it their obligation to serve their country in time of war and to prepare for that service in time of peace.

Major Noble aptly says that "Preparedness is but the premium on the life policy of the nation, and medical preparedness is the premium on the health of the Army." He calls attention to the fact that disease destroys four times as many soldiers as are killed and wounded, and that an efficient army can come only from healthy soldiers. He mentions the sad story of medical unpreparedness in the Spanish-American War when in one concentration camp of 11,000 men 529 died in four months, only to compare it with medical preparedness at San Antonio in 1911, when with 12,801 soldiers in camp for the same time there were only 11 deaths and only one death from typhoid. There has been wonderful improvement in the medical corps of the Army in the last few years and the recent legislation providing for 7 medical officers for each 1,000 of enlisted men will make it even more efficient.

What is now the Medical Reserve Corps and which will before June of this year be called the Medical Section of the Officers' Reserve Corps is regarded by Major Noble as the greatest advance for military preparedness in time of war, because millions would be enlisted then and physicians should be trained for that service. Twenty-five thousand physicians should enlist in the Reserve Corps but up to this time the very small number of 2026 have responded to the call. The officers of the Reserve Corps do not have to be called out in time of peace but they may if they desire attend a training camp for two weeks each year or take the correspondence course. Specialists as internists, surgeons, pathologists, etc., since they will be called upon to serve in the line of their work, are not expected to take the training for the regular reserve.

There are many advantages to a physician in becoming an officer in the Medical Section of the Officers Reserve Corps and this opportunity of preparing to serve one's country should war ever come should be grasped by all thinking physicians.

REAR ADMIRALS BRAISTED AND GRAYSON.

President Wilson, in appointing Surgeon-General W. C. Braisted and Dr. Cary T. Grayson of the Navy as two of the five new Rear Admirals recently created by Congress, recognized the merit of two distinguished officials.

Surgeon-General Braisted has made a great record in broadening the scope, and in increasing the efficiency of the Medical Corps of the Navy; and while naval aide to Presidents Roosevelt, Taft and Wilson, Dr. Grayson has performed important and distinguished service as physician to three of the Nation's chief executives. Aside from the honor, the increased pay of these officials is deserved, because men of their ability and attainments would in civil life be earning several times the salary of a Rear Admiral. It is not infrequent for a surgeon to get a fee from one operation, or for a lawyer to receive an amount from one client, equal to the salary of an entire year for a surgeon of high rank in the Army or Navy.

The officers of the Medical Corps of the Army and Navy and those in the United States Public Health Service should have the same rank and pay as the officers in the line. Since Surgeon-General Gorgas has been made a Major-General in the Army—the only medical officer ever accorded the rank—and two physicians in

the Navy have been made Rear Admirals there is hope that the medical men in all of the governmental services will at least receive the same rank and pay as the men in other branches of the same departments.

DR. SANDERS RESIGNS AND DR. WELCH IS ELECTED STATE HEALTH OFFICER OF ALABAMA

After twenty-one years of distinguished service as State Health Officer of Alabama, Dr. W. H. Sanders has resigned. At the meeting of the Alabama State Medical Association last April, Dr. Sanders tendered his resignation on account of ill health, but it was not accepted because of his long and faithful service and because of the esteem and affection in which he is held by the physicians of his state. Not having improved in health Dr. Sanders recently insisted that a successor be elected.

For half a century Dr. Sanders has been recognized as one of the ablest and one of the most cultured men in the medical profession; and since the death of Dr. Jerome Cochrane, whom he succeeded as State Health Officer, he has been regarded as the Nestor of the physicians of Alabama. He has an enviable record as a sanitarian. One of the greatest triumphs of sanitation in this or any other country was the work of Dr. Sanders in 1905 when he kept Alabama free from yellow fever while it was raging in Louisiana, Mississippi and Florida. For this and for the faithful performance of his duty during his years of public service the citizens of Alabama will always hold him in grateful reverence.

While there have been many expressions of regret that Dr. Sanders feels that he is not physically able to continue his duties as State Health Officer, the announcement that Dr. Samuel W. Welch, of Talladega, has been elected to succeed him was received with general approval. It is regarded as the just recognition of the man who is best prepared to carry on the work of Dr. Sanders. Dr. Welch has had years of experience as health officer for the City and County of Talladega; and since he has been a member of the State Committee of Health he has been closely associated with Dr. Sanders and is thoroughly familiar with health conditions in Alabama. Dr. Welch is a physician of unusual ability and has long been a leader among the medical men of his state. His whole soul goes into the work of improving the health of his people; and being an untiring worker, combined with the ability to handle men, we predict that he will measure up to the wonderful opportunity for service that is offered him as State Health Officer of Alabama.

THE SOUTHERN SURGICAL ASSOCIATION

The Southern Surgical and Gynecological Association, founded by the lamented Dr. W. E. B. Davis and his distinguished brother, Dr. J. D. S. Davis, of Birmingham, has been recognized for many years as the leading association of surgeons in America. While the meetings are always held in the South, it is not a regional organization, as its name indicates, because it has among its limited membership of 200 most of the great surgeons from all parts of the United States.

Since the death of Dr. Elias Davis, in 1905, Dr. W. D. Haggard, of Nashville, has been the Secretary and executive officer. In the annual transactions as published by Dr. Davis and Dr. Haggard have been recorded much of the history of surgical progress in this country for the last quarter of a century.

At the recent meeting at White Sulphur Springs, the name was changed to "The Southern Surgical Association" and Dr. Haggard was deservedly promoted from

Secretary to President, and Dr. H. A. Royster, of Raleigh, North Carolina, was elected Secretary. With such distinguished surgeons as officers the Southern Surgical Association will surely continue the high standard of work that it has always maintained.

DR. DOWLING'S REAPPOINTMENT

Governor Pleasant, the State of Louisiana, the South and the Nation are to be congratulated that Dr. Oscar Dowling has been reappointed President and Executive Officer of the Louisiana State Board of Health. Dr. Dowling is recognized as one of the most efficient men in public health work and the Louisiana system of educating the public in sanitary matters is considered one of the great advances in preventing disease.

When Dr. Dowling was appointed to his present position eight years ago he had the vision that in order to lessen sickness, people of all classes must be informed regarding the causes of diseases, of how they are spread, and of the measures to prevent them. He realized that most persons will not go out of their way to learn, so that he conceived the idea of carrying instruction in health matters to the remote parts of his state. He was able to show certain railroad officials in Louisiana that it was to the interest of the railroads to aid in preventing disease, and with a small appropriation from the State he inaugurated the Louisiana Health Train, the first of its kind anywhere.

This "Health Train" has carried the gospel of health many times into every place in Louisiana where there is a side track; and by invitation, through the courtesy of the railroads, it has gone into almost every state in the Union in the beneficent work of educating the public in sanitation. Millions have therefore received the message of health through Dr. Dowling's idea.

Dr. Dowling as an advertising asset to Louisiana is worth many times his salary, because everybody everywhere has heard that he has "cleaned up" New Orleans and Louisiana. One advertising page in the *Saturday Evening Post* costs $5,000.00 and space in the columns of its reading matter cannot be bought at any price; but Dr. Dowling was given a page in "Who's Who and Why" in that great advertising medium. *World's Work* and many other magazines have also published pages on Dr. Dowling's work until Louisiana is regarded as a model in sanitation —surely a good reputation for a state to have, whether it deserves it or not.

Dr. Dowling has not only advertised Louisiana, and educated its people in sanitary matters, but he has forced many who had powerful political influence to "clean-up." This class demanded Dr. Dowling's removal. Be it said, however, to the credit of Louisiana's governors, including the present incumbent, they have recognized that political motives are not to be considered in comparison with the health of their people and true merit in an official. Dr. Dowling has therefore carried on his good work through the changing administrations; and since public opinion is back of him in his work it is likely that he will remain as long as he wishes in charge of the health of the people of Louisiana.

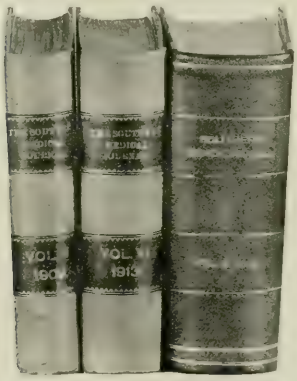
THE HIGH COST OF LIVING AND THE SOUTHERN MEDICAL JOURNAL

Dr. James M. Jackson in his address as President of the Southern Medical Association at the Jacksonville meeting, in 1912, said:

"I know of no higher class journal than the Southern Medical Journal. Its able editorial management has given you a publication to whose coming you can look forward with pleasure, for you will always find between its covers something original and instructive, and, in addition, you can have the satisfaction of knowing that you have

one of the best journals in the country, one of which every member has reason to feel proud. When I consider that our dues are but $3.00, with the Journal included—annual meetings and discussions thrown in—I can heartily say that the members of this organization have no cause to complain of the high cost of living, especially of the medical food from the Southern Medical Association."

In the four years since the above was written the increase in the cost of everything pertaining to publishing a medical journal has increased enormously, not to mention the high cost of living generally. Paper alone has increased in price 80 per cent. in the last twelve months, but this has not retarded the progress of the SOUTHERN MEDICAL JOURNAL. We publish approximately 100 per cent. more matter than in 1912 and many other improvements have been made. The division of



subjects into departments and the publication of authors' abstracts of many important articles in current medical literature are innovations in medical journalism that place the SOUTHERN MEDICAL JOURNAL in a class to itself. The medical news from the sixteen Southern states has also proven an attractive feature, as have also "placeboes" for those who enjoy medical humor.

While newspapers and magazines have complained of the high cost of paper, ink, etc., and many of them have decreased their size or have increased their subscription rates, the SOUTHERN MEDICAL JOURNAL does not propose to print a page less in 1917 than in 1916 when it published more matter than ever before, and it is planning still further improvements.

The JOURNAL also intends to continue the high standard of advertising that it has maintained throughout all the years of its existence. The motto that was formerly published on the front cover page, "The truth and the truth only on every page from cover to cover," will be lived up to in its advertising pages as well as in every other deprtment of the JOURNAL. The strict advertising policy causes it to decline thousands of dollars a year in contracts that are carried by many prominent medical publications. It is realized, however that the JOURNAL could not have attained its place in the medical world with anything less than absolutely clean advertising.

The bound volume of the 1916 JOURNAL is one of the handsomest and is the largest medical book on its office selves. It contains in its 1604 pages the history of medical progress during the most eventful year in medical history. The index shows that in 1916 the JOURNAL published 55 original articles on medicine; 19 on tropical diseases; 33 on public health; 51 on surgery; and 28 on eye, ear, nose and throat,—a total of 186 original articles. In addition there were published 95 authors' abstracts, so that 281 physicians contributed to the columns of the JOURNAL in 1916, and all branches of medicine were covered.

It is believed that the best year book published for 1916 for the physicians of the sixteen Southern states is the bound volume of the SOUTHERN MEDICAL JOURNAL. Every physician should bind his journals. They make reference volumes of great

value and add to the appearance and usefulness of the medical library. To those who desire to bind their 1916 SOUTHERN MEDICAL JOURNALS and who have misplaced one or more numbers the JOURNAL will gladly furnish them, with its compliments, if it has them on hand. Begin now to save your journals for 1917 and have them bound at the end of the year.

In order to show the development of the JOURNAL and the attractiveness in appearance of the bound volumes a cut of the bound volumes for 1909, 1913 and 1916 is here shown.

SOUTHERN MEDICAL NEWS

ALABAMA

According to the report of the State Board of Health for November, there were reported 179 cases of tuberculosis and 169 deaths from this disease, there being a total of only 365 deaths from reportable diseases.

At Birmingham, at a recent meeting of the Jefferson County Medical Society, Dr. F. E. Harrington, of the United States Public Health Service, was elected as all-time Health Officer of the county, operating under the plans recently elaborated by Dr. Carl Fox, U. S. P. H. S.

At Birmingham, recently, the employees of the City Health Department demanded an increase of salary.

At Anniston, recently, Dr. Jerry Watson sustained rather painful injries when his automobile was struck broadside by a street car.

Recently a state-wide probe was made by the Government agents for the purpose of discovering violations of the Harrison anti-narcotic law. A number of arrests have been made in Mobile.

At Mobile, Assistant Surgeon T. J. Liddell has been in charge of the United States Marine Hospital during the absence of Dr. J. T. Burkhalter.

At Talladega, on December 15, Assistant Surgeon J. B. Laughlin investigated the water supplied to the passenger trains engaged in interstate traffic.

Deaths

Dr. E. H. Robinson died at his home in Robinson Springs on November 22 at the age of 89.

Dr. E. S. Feagin, a prominent Mobile physician, died at his home in that city, at the age of 35 years.

Dr. John B. Stagg died at his home in Pratt City at the age of 56 years on Nov. 23.

ARKANSAS

At Little Rock, on November 18, during the annual meeting of the State Board of Health, the following officers were elected: President, Dr. Joseph B. Clegg, Siloam Springs; Dr. Burrell A. Fletcher, McClelland, Vice President; Secretary and State Health Officer, Dr. C. W. Garrison.

On December 14, official notice was given by the State Board of Health as to the revocation of Dr. W. C. Baldwin's license. Dr. Baldwin was a physician of Helena, and the charge that he advertised special ability to cure chronic and incurable diseases led to the revoking of his license.

It has been announced that the next meeting of the Arkansas Medical Society will be held in Little Rock on May 1-3, 1917.

Dr. M. B. Heyman, who has been with the Central Islip Hospital, Long Island, has been appointed Superintendent of the State Hospital for the Insane. Dr. Heyman succeeds Dr. E. P. Bledsoe in the management of the institution.

At McGeehe, Dr. J. M. Stewart has been very ill following a stroke of paralysis.

Dr. Robert Corney, Little Rock, has been appointed Physician to the Tucker Convict Farm.

Deatns

Dr. H. J. E. Garrett, aged 55, died at his home in Hope on Nov. 17.

Dr. A. D. Finch, aged 67, died at the home of his son at Bellefonte on Nov. 7.

Dr. John Capell, Watsou, died in Memphis at a local hospital on Nov. 21.

FLORIDA

At Jacksonville, at a recent meeting of the Association of Surgeons of the Seaboard Air Line, the following officers were elected for the ensuing year: Dr. Frank Eskridge, Atlanta, Ga., President; Drs. L. J. Picot, Littleton, N. C.; J. W. Smith, Branchville, Va., and Thomas J. McArthur, Cordele, Ga., Vice Presidents. Dr. J. W. Palmer was re-elected Secretary-Treasurer.

At Tampa, the City is contributing $50.00 per month toward the maintenance of a tuberculosis clinic.

The physicians of Duval County have raised their fees from $2.00 to $3.00 per visit.

GEORGIA

The State Board of Health has recently issued a bulletin to the people stressing the importance of plenty of fresh air.

Dr. J. G. Hall, Atlanta, was painfully injured recently when the automobile which was driving crashed into a sidewalk at Five Points.

At Moultrie, the physicians of Colquitt County met recently and organized a medical society.

Dr. J. Cheston King, Atlanta, has been elected Medical Director of the Columbian Woodman.

At LaGrange, at the annual election of officers of the Troupe County Medical Society, the following officers were elected: Dr. Henry R. Slack, President; Dr. Will E. Morgan, Vice President; Dr. John Banks, Secretary-Treasurer.

Dr. D. A. Bagley, DeSoto, was married to Miss Bessie Klosterman, East St. Louis, Ill., Nov. 14.

(Continued on page 24)

No matter how high the standard—

unless it is backed-up by a steady continuity of "efficiency"—the end-result will be mediocrity. The phrase "Quality Products" would be empty patter were it not backed-up by that honesty of purpose and ceaseless study to improve which constitute "the bone and gristle" of our 57-years' record as tried-and-not-found-wanting purveyors to the medical profession—a continuous output of distinctly worth-while products of unquestioned quality.

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(Continued from page 182)

At the annual meeting of the Georgia Medical Society at Savannah the following officers were elected for 1917: President, Dr. Antonio J. Waring; Vice President, Dr. J. O. Baker; Secretary-Treasurer, Dr. Wm. H. Myers; Board of Censors, Drs. Lawrence Lee, H. H. McGee and H. W. Hesse; Library Board, Drs. Geo. R. White, J. A. Crowther and V. H. Bassett.

Deaths

Dr. J. T. Nunnally, Griffin, died at his home in that City on Dec. 8 at the age of 47.

Dr. C. C. Frederick, Lizella, died at a Macon hospital on Dec. 20 as the result of injuries received when his automobile was struck by a railway train.

Dr. J. C. De La Perriere, Winder, died at his home in that City on Oct. 11.

Dr. Henry R. Marchman, Villa Rica, died at his home on Nov. 15 at the age of 48.

Dr. L. W. Verdery, age 28, of Augusta, died on Oct. 28 while on duty with the Medical Corps of the National Guard at Fort Sam Houston, San Antonio, Tex.

Dr. J. S. Horsley, age 73, died at his home in West Point on Nov. 17.

KENTUCKY

At Fort Thomas, in honor of the memory of Dr. James Carroll and as a token of recognition of the services rendered the Government by him when he lost his life in the fight against yellow fever, Congress has given one of the cottages in Officers' Row to be used by his wife and children as a permanent home.

At Lexington, during a recent investigation of the street car sanitation by Dr. J. D. McGuire, City Health Officer, it was decided that plans should be made for more healthful ventilation.

Dr. W. L. Heizer, Bowling Green, has accepted the position as State Secretary of the Tuberculosis Commission.

At Henderson, the new county tuberculosis sanitarium will soon be opened for service.

At Louisville, according to a recent statement made by the Health Commissioner, there has been a great increase in the number of diphtheria cases in the City.

At Louisville, the School for City and County Health Officers was in session Dec. 13-16.

Suit brought by the citizens of Henry County to enjoin the County Board of Health from enforcing the vaccination of the pupils and teachers in the schools was lost, as the court held that such an important matter should not be left to the whim of individuals.

At Louisville, according to recent statistics, the City is said to be ahead of both the State and Nation in regard to the low tuberculosis death rate.

Dr. W. F. Phillips, Bowling Green, was reported very ill recently following a paralysis stroke.

Dr. N. Douglass Abell, Louisville, was married to Mrs. Annie C. Wolfe, New Castle, on Nov. 4.

Deaths

Dr. Peter S. Gans, aged 55, died at his home in Louisville on December 23.

Dr. Edwin R. Montgomery, aged 69, of Louisville, died in Birmingham, Ala., while at the home of his daughter.

Dr. J. H. Owsley, age 75, died at his home in White Mills on Dec. 1.

Dr. A. M. Crittenden, age 58, died at his home in Ferguson on Nov. 15 from carcinoma of the throat.

LOUISIANA

At New Orleans, a chapter of the American Red Cross has been formed and a movement on placed foot to raise $25,000 for the erection of a base hospital.

At Shreveport, due to a shortage of the funds of the City, the Charity Hospital has negotiated the loan of sufficient moneys from a bank of that City.

After examinations held for license to practice in the State, it has been announced that sixteen out of the eighteen candidates were successful.

At Vinton, Past Assistant Surgeon Friench Simpson was recently investigating a case reported to be bubonic plague.

Deaths

Dr. M. T. Lanaux died in New Orleans on January 12.

Dr. Jacob Wise, of Crichton, 29 years old, died in December while on a hunting trip in Texas.

Dr. James McCreary, aged 80, died at his home at Point on Dec. 8.

Dr. N. S. Carter, aged 83 years, died at his home in Abbeville on Dec. 18.

Dr. E. A. Welsh, aged 52, died on Oct. 6 at his home in Shreveport.

MARYLAND

There have recently been reported a number of cases of typhoid fever at Goucher College, and it is believed that the spread is due to a carrier.

At Baltimore, according to a recent report for November, there is a decided increase in the number of tuberculosis cases reported in contrast to November of 1915.

At Baltimore, Dr. and Mrs. Hugh H. Young have given an ambulance to be used in the service in France.

At Mount Washington, there have been a number of cases of scarlet fever reported and the contagion is assuming the proportions of an epidemic.

Johns Hopkins University has at present a branch of the Medical Department in Chiengmai, Siam, under the leadership of Dr. C. H. Cort.

At Baltimore, there has been organized a bureau of communicable diseases in charge of Dr. John F. Hogan. Health wardens, the nursing division, tuberculosis dispensaries, school physician, clerk of vital statistics, fumigation division, complaint clerk, tenement house division and the Sydenham Hospital will be included under the new regime.

At Baltimore, in order to organize reforms that could not be carried out singly and to protect themselves against the high cost of living, the hospitals of the City have formed a union.

At Baltimore, the University of Maryland has been paid the amount of $30,000 for medical education, the sum appropriated for 1916 and unpaid appropriation for 1915.

The Governor of the State has announced that there will be a Lunacy Commission appointed to

(Continued on page 26)

Most Women Are Chronically Constipated

for all of the obvious reasons, plus those due to anatomic, neurologic, dietetic conditions—and "the procrastination habit."

In connection with other measures, (for **INTEROL** is what one writer would call a "dietetic accessory") **INTEROL** so facilitates passage of the intestinal contents that their journey is made easy, and the patient is trained to go to stool regularly.

Oftentimes, **INTEROL** proves a valuable adjunct in the treatment of female neurasthenia, which so often results (or is aggravated by) intestinal autotoxemia. Because (1) it reduces the length of time in which the fecal mass (with its toxins) remains in contact with the water-absorbing mucous membrane of the colon; (2) it holds these toxins in suspension; (3) it changes the bacterial surroundings—the "intestinal flora."

INTEROL is a *particular kind* of "mineral oil," and is not "taken from the same barrels as the rest of them": (1) there is no discoloration on the H_2SO_4 test—absolute freedom from "lighter" hydrocarbons—so that there can be no renal disturbance; (2) no dark discoloration on the lead-oxide-sodium-hydroxide test—absolute freedom from sulphur compounds—so that there can be no gastro-intestinal disturbance from this source; (3) no action on litmus—absolute neutrality; (4) no odor, even when heated; (5) no taste, even when warm. The most squeamish or sensitive woman can "take" **INTEROL.**

Pint bottles, druggists. **INTEROL** booklet on request; also literature on "Chronic Constipation of Women."

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Itching and irritation are relieved at once, and while the activity of the skin is maintained, the dissemination of infectious material is also prevented. So notable are the benefits that result from the use of this **non-greasy, water-soluble** and **delightfully clean** product that its use has become a matter of routine in the practise of many physicians.

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NOT A PARTICLE OF GREASE

Druggists, collapsible tubes, 50c.

Samples and literature.

VAN HORN and SAWTELL
15 and 17 East 40th St., New York City

(Continued from page 24)

study the causes and prevention of insanity in the State.

At Baltimore, the Hunterian Research Laboratory, made possible by the beneficence of the Rockefeller foundation, has been opened. The building was erected at the cost of about $115,000 and will be utilized for higher phases of research work.

Dr. M. V. Ziegler, Townson, was married recently to Miss Janet M. Bosley, of Chicago.

Dr. Robert P. Bay, Baltimore, was married to Miss Nancy McNabb on Dec. 23.

Dr. Benjamin Tappan, Baltimore, was married to Miss Elise Gail on Nov. 18.

MISSISSIPPI

The Board of Supervisors of Jones County has appropriated the sum of $1,600 to be used in cooperating in the survey being conducted by the State Board of Health and the Rockefeller Foundation.

At Vicksburg, recently, representatives of Warren, Claiborn, Sharkey and Issaquena counties held a "get-together" meeting and foundations laid for the formation of an association combining the counties.

At Louisville, at the last quarterly meeting of the Neshoba-Winston-Newton Tri-County Medical Association, the following officers were elected: President, Dr. Z. C. Hagan, Union; Vice Presidents, Dr. W. H. Mars, Philadelphia, and Dr. E. L. Brontly, Dixon; Secretary-Treasurer, Dr. S. A. Majure.

At Richton, the Perry-Green-George Tri-County Medical Association elected the following officers for the ensuing year: President, Dr. S. L. Knight, Merrell; Vice Presidents, Dr. E. Faulk, Dr. J. A. Dorsett, Lucedale, and Dr. S. B. McIlwain.

Deaths

Dr. H. D. W. Showers, aged 48, formerly of Meridian, died in the Long Island State Hospital on Nov. 29.

NORTH CAROLINA

The Tri-State Medical Association of the Carolinas and Virginia will convene at Durham on Feb. 21 and 22, Dr. J. A. Hodges, Richmond, presiding.

At Rocky Mountain, there have been reported a large number of cases of measles. The contagion seems to be spreading and parents have been warned that the children should be kept at home.

Dr. William C. Sandy, Columbia, Medical Director for the State Hospital for the Insane, is conducting a survey of the county institutions of Pennsylvania under the auspices of the Public Charities Association of the State.

Dr. J. F. Robertson, Wilmington, was married to Miss Juliette Albright, of the same City, on Nov. 15.

Lieutenant Arden Freer, M. C., U. S. Army, and Miss Mary H. Sheetz, Fayetteville, were married on Nov. 28.

Deaths

Dr. Henry H. Whittaker, aged 55, died at his home in Hollingsworth, Md., on Oct. 12. He was formerly a member of the Medical Society of North Carolina.

OKLAHOMA

At Guthrie, the Oklahoma State Health Association was organized on Nov. 16 with the following officers: President, Dr. G. W. Stewart, Hobart; Vice Presidents, Dr. Claude A. Thompson, Muscogee; Dr. Lloyd T. Lancaster, Cherokee, and Dr. H. P. Wilson, Wynnewood; and Dr. L. E. Emanuel, Chickasha, Secretary-Treasurer.

At Ardmore, a $50,000 annex is being erected to the Hardy Hospital.

At Oklahoma City, the Tulsa County Medical Society has gone on record as favoring the erection of a $200,000 hospital to be under the direction of the Medical Department of the State University.

Dr. L. F. Watson, of Oklahoma City, has moved to Chicago, with offices in the Marshal Field Annex Building. He will limit his practice to surgery.

At Okmulgee, a City Medical Society was organized recently with the following officers: President, Dr. W. C. Mitchener; Vice President, Dr. L. A. Alexander; Secretary-Treasurer, Dr. A. H. Herr.

The State Medical Association is planning a vigorous campaign against tuberculosis.

At Cordell, Dr. J. H. Harms was recently injured when his automobile was driven into an open bridge.

Dr. J. G. Rafter, Muscogee, sustained severe injuries when his automobile was struck by a street car.

Dr. W. B. Tilton, Clinton, has recently received the appointment as Physician to the Uintah and Ouray Indian Reservation.

Dr. C. W. Tedrowe, Woodrowe, and Miss Margaret Chriswell, Elk City, were married Nov. 24.

Dr. O. J. Walker, Oklahoma City, was married to Miss Mary Getty, Wilmington, Pa., recently.

Deaths

Dr. C. E. Damrel died in Tulsa on Nov. 17.

Dr. J. L. Hosall, aged 43, Oklahoma City, lost his life in an automobile accident on Jan. 4.

Dr. Thomas W. Smith, aged 42, of Kiefer, died in a Tulsa hospital on Nov. 10.

SOUTH CAROLINA

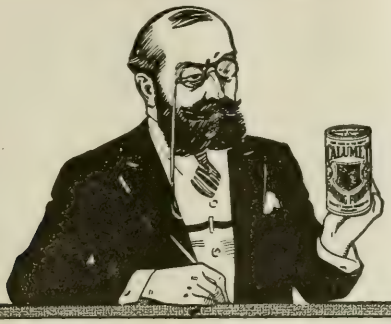
At a meeting of the South Carolina Medical Society which convened at Charleston on December 27, the following officers were elected: Dr. Lan Mullally, president; Dr. Edward Rutlidge, vice-president; Dr. Henry P. Wagner, secretary, and Dr. Daniel L. McGuire, treasurer.

At Charleston, by a unanimous decision of the board of trustees of the State Medical College, women will be allowed to matriculate in the school.

At Charleston, the Medical College of the State of South Carolina has provided a course of lectures on public health.

Asst. Surg. W. F. Wagenbach, M. C. Edmunds, and W. S. Bean, U.S.P.H.S., have been ordered to Spartanburg, S. C., to report for duty in the pellagra investigation work being carried on by Dr. Goldburger.

(Continued on page 28)



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(Continued from page 26)

Deaths

Dr. Arthur S. Townsend, 53 years old, died at his home in Bennetsville on November 13.

Dr. Charles N. Wyatt, 53 years old, died at his home in Easley on December 27.

TENNESSEE

At Memphis on December 11 to 13 there was held the annual meeting of the American Academy of Ophthalmology and Oto-Laryngology with Dr. J. E. Brown, Columbus, O., presiding and Dr. Lee M. Francis, Buffalo, Secretary. The following officers were elected for the ensuing year: President, Dr. W. L. Dayton, Lincoln, Neb., and Dr. L. M. Francis re-elected Secretary. The next meeting will be held in Pittsburg.

At the meeting of the Tennessee, Arkansas, Mississippi Tri-State Medical Association the following officers were elected for the ensuing year: Dr. James W. Gray, Clarksdale, Miss., President; Drs. H. R. Hays, North Carrollton, Miss., R. W. Griffin, Tiptonville, Tenn., and Floyd Webb, Turrell, Ark., Vice Presidents; Dr. James L. Andrefs, Memphis, re-elected Secretary, and Dr. James A. Vaughan re-elected Treasurer.

There was a meeting of the Middle Tennessee Medical Association at Franklin on Nov. 16 and 17.

A. L. Saunders, negro physician, is out under a $1000 bond at Memphis for alleged violation of the federal anti-narcotic law.

The State Anti-Tuberculosis Association has launched an active campaign against the disease in the state and a number of the counties have responded readily to the work. A new league of Memphis and Shelby County is being organized.

Among the reforms asked for by the Memphis doctors at their recent hearing before the legislature was for a law making it harder to send a patient to the insane hospital.

Dr. W. S. Farmer, of Cookville, was recently appointed to succeed Dr. A.E . Douglass as superintendent of the Central Hospital for the Insane near Nashville.

Deaths

Dr. J. W. Grissard, aged 68, died at his home at Winchester on Dec. 7.

Dr. E. R. Verner, of Nashville, died at the home of his son in Los Angeles on Dec. 16.

Dr. John S. Cain, founder of the University of the South's Medical Department, died at his home at Sewanee on Dec. 3, at 87 years of age.

TEXAS

At Blue Ridge on Dec. 5, Dr. W. A. Houser was shot in the leg in a shooting fray in which he killed Stanley McCollum.

At Fort Worth a contract has been let for the erection of a sanitarium by Drs. Clay Johnson and F. C. Beall.

At a meeting of the North Texas Medical Association which was held in Dallas on Dec. 12 and 13 the following officers were elected: President, Dr. Will Cantrell, Dallas; Vice President, Dr. C. O. Harper, Fort Worth (re-elected); Secretary, Dr. H. L. Moore (re-elected), and Treasurer, Dr. D. L. Bettison, Dallas.

At Dallas a plan is on foot to move the Emergency Hospital from the basement of the Municipal Building and add it to the City Hospital.

At San Antonio, the Robert B. Green Memorial Hospital has been opened with Dr. H. P. Hill as the superintendent. The amount of $11,000 has been donated by Mr. Alexander Joske for the equipping of operating clinical and X-ray rooms.

At Dallas a municipal Dental Clinic is in operation.

Deaths

Dr. W. H. Ash, aged 69, died at his home in Jourdanton on Nov. 17.

Dr. Charles Y. Hogsett, of Fort Worth, died at Saratoga Springs, N. Y., on Nov. 26.

Dr. R. J. Kennedy, aged 75, died at Fort Worth on Nov. 8.

Dr. Charles W. Lester, aged 58 years, died at his home in Guthrie on Oct. 11.

Dr. G. T. Thomas, aged 61, died at Jonesboro, on Dec. 21. He was a citizen of Rogers.

VIRGINIA

At Richmond a $175,000 contract for the erection of a negro pavilion of the Memorial Hospital has been let. There will be accommodations for 146 patients.

At the Dec. 12 meeting of the Southside Virginia Medical Association held at Petersburg, the following officers were elected for the ensuing year: President, Dr. Joel Crawford, Yale; Vice Presidents, Drs. F. J. Wright, Petersburg, James H. Hargrave, Hopewell, and Edgar W. Young McKenney; Dr. E. F. Reese, Courtland, was re-elected Secretary-Treasurer.

The Board of Supervisors of Montgomery County have appropriated $300 for the purpose of conducting a health campaign in that county. The State Board of Health appropriated $900 for the same cause.

The Seaboard Medical Association of Virginia and North Carolina held its annual meeting in Washington, N. C., with Dr. D. T. Tayloe, Washington, President, and Dr. C. P. Jones, Newport News, Secretary.

A bill was introduced in the House of Representatives, recently, appropriating $500,000 for the erection of a Marine Hospital at Norfolk.

Two physicians of the eastern part of the State were arrested recently for their failure to report births.

Dr. G. T. Harrison, Charlottesville, and Miss Cornelia Seymour, N.Y.C., were married on Nov. 21.

Dr. W. H. Evans, of Lynchburg, was married to Miss Agnes I. McGregor on Dec. 24.

Dr. Stephen H. Watts, of Charlottesville, and Miss Sarah Tilt, Atlanta, were married on Dec. 21.

Deaths

Dr. George Ben Johnston, aged 63, died suddenly at his home in Richmond on Dec. 20. He was professor of surgery in the Medical College of Virginia and was well known throughout the country for his skill in his chosen specialty.

Dr. S. R. Glover, aged 47, of Midway Mills, died on Dec. 5.

Dr. B. F. Hopkins, aged 88, of Hot Springs, died at the home of his daughter in Staunton on Dec. 26.

Dr. H. R. Dupuy, aged 71, died at his home in Norfolk on Dec. 11.

(Continued on page 30)

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Pettijohn's Flour is 75 per cent fine patent flour mixed with 25 per cent tender bran flakes. To be used like Graham flour in any recipe; but better, because the bran is unground.

The Quaker Oats Company
Chicago 1512)

(Continued from page 28)

Dr. David Claytor, aged 84, died at his home near Bedford on Nov. 17.

Dr. Thomas F. White, aged 90, died at his home in Hanover County, Dec. 18.

Dr. James F. Gardener, Capon Bridge, died on Nov. 11 from injuries received in an automobile accident near Winchester.

Dr. T. M. Cherry died at his home in Roanoke on Dec. 12.

Dr. K. H. Trimble, aged 57, died at his home in Monterey on Dec. 22.

Dr. J. W. Poindexter, Medical Department of the University of Virginia, 1875, died at his residence in Prairie Home, Mo., on Sept. 12.

Dr. Warren Lewis died at his home in Wayland on Dec. 10.

Dr. B. F. Tatum, aged 49, died at his home in Stuart on Dec. 29.

Dr. J. W. Nelson died at his home in Charlottesville on Dec. 15.

Col. H. S. T. Harris, a native Virginian, Chief Surgeon of the Western Division of the United States Army, died suddenly in San Francisco on Dec. 18.

Dr. M. W. O'Brien, aged 61, died at his home in Alexandria on Dec. 28.

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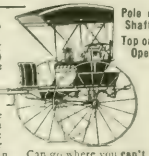

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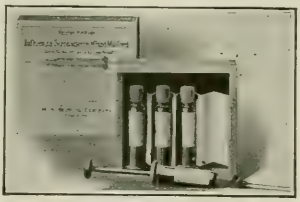

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